VOL. III. APRIL, 1893. NO. 3.

THE MONIST.

RELIGION AND MODERN SCIENCE.

I.

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THE ancient conflict between religion and science is now, at the close of the nineteenth century, more animated than ever before. This conflict has formed the intellectual pivot of civilisation ever since Christianity first afforded the western peoples of Europe the inconsistent spectacle of a religion which made abundant use in its dogmatic constructions of the theories of contemporary science, and yet assumed a hostile attitude towards the fundamental principle of all science, the spirit of research and unbiassed judgment generally. Rightly has one of the acutest modern critics of Christianity, Ludwig Feuerbach,* maintained, that the Christian sophistic philosophy is the necessary outcome of this inconsistency, which proclaims as absolute truth a definite, historical revelation, such as is found in the Bible, and simply assigns to the reason the subordinate and improper office of harmonising and defending what is there laid down.

There are, it is true, a great number of people, who are not disposed to see the bitterness of the conflict now raging. It has become customary for us to look upon the nineteenth century as an age of the comprehension of religion, and to distinguish it from the eighteenth century, which is regarded as a period of mere religious criticism. We boast of having rediscovered religion, and of having

* *Wesen des Christenthums.* First edition. 1841. Pp. 288–289.

secured to it a permanent province in the dominion of the mind. But the facts of our public life stand in curious contradiction to these assertions. In all civilised nations, in literature, in parliamentary procedures, in all questions that relate to religious and moral life or to education, the attentive observer will find that a profound chasm divides humanity. Every one feels the desirableness of bridging over this chasm, that the members of society may be united in common labor; but again and again we are made to experience how irreconcilable the respective claims of the opposed parties are. He who has studied the bulls and encyclical letters of the last two popes, Pius IX. and Leo XIII., and the commentaries on these utterances in the *Civiltà Cattolica*, the official organ of the curia; he who is acquainted with the polemical diatribes of the French Catholics against the positivists and freethinkers, and against the school and church legislation of the third republic; he who has any knowledge of that mass of controversial literature, which the proclamation of the doctrine of papal infallibility in the year 1870 evoked; he who has followed the eventful and varied history of the so-called "Culturkampf" in the German Empire, from the era of the minister Falk, down to the recent bill for a new School-law in Prussia, defeated amidst the greatest excitement in all parts of Germany; he who is the least bit at home in the literary feuds which are being fought out in the domain of historical theology concerning the validity and credibility of the original sources of Christianity; he, finally, who will place the writings of Cardinal Newman or of the Jesuits Pesch and Cathrein by the side of those of Huxley and Spencer, by the side of those of Du Bois-Reymond, Strauss, and Dühring: he, I say, who has gone through with a critical spirit all that I have cited in the preceding sentences, will surely not be apt to contradict this assertion of mine that civilised humanity to-day is separated into two groups which no longer understand each other, which do not speak the same language, and which live in totally different worlds of thought and sentiment—at least so far as this one critical point is concerned of man's relation to religion.

> "*Wie Ja und Nein sind sie,*
> *Wie Sturm und Regenbogen.*"

Have we, then, learned nothing and forgotten nothing since the days of rationalism? The tremendous labors which our own century has devoted to the investigation of religion in all its forms, to the unfolding of its connection with racial mind and sentiment, and of its relation to civilisation generally, and finally to the elucidation of the origin and development of the great forms of religion: has all this had no other result than that we, after a century of the most laborious research, again find ourselves in the same attitude of unintelligent hostility towards religion and Christianity in which the eighteenth century revelled, and out of which we have only fought our way by the united efforts of a host of profoundly enlightened minds?

This argument has been advanced in opposition to the leaders of the rationalistic movement and to the work of the eighteenth century in varying forms, by the party which seeks to ally the science of the present and the religion of the past. It is seriously said and enjoined that only they who are far behind the science of the times and hold aloof from the true spirit of the age can still assume the repugnant attitude toward religion which was characteristic of the mind of the eighteenth century.

It is high time to point out the crude confusion of ideas which lies at the basis of this argument. It confounds the historical understanding of a thing with the philosophical approval of it. But these are two totally distinct things. We understand a phenomenon historically, when we are clear in our minds concerning the external conditions and habits of thought of humanity from which it sprung; when its main-springs of action and its purposes, as well as the effects which have proceeded from it, are distinctly traceable. The more closely our mental pictures of these things correspond to the facts as they actually were at the origin, and the more they conduct us from the mere surface of phenomena into the secrets of their psychological and sociological connection, and teach us to understand these things as products of mind and of society, the higher will our historical knowledge of them be rated. In this sense the knowledge which the eighteenth century had of religious phenomena was undoubtedly very imperfect. True, even here great advances beyond

the age which preceded, are noticeable. People had ceased to regard the origin of the Jewish and Christian religion as a supernatural event and as the immediate work of God; all religions were placed upon the same footing, as species of the same kind; and efforts were made to discover their common characteristics and the law of their origin. But the people of that period were not yet able to arrive at the true essence of religious ideas and sentiments. They were hardly in a position to describe them properly, let alone to explain them. Of the hypotheses devised to throw some light into the darkness that hung over the beginnings of religions, not one proved itself competent to supply what was hoped for. All that they could derive from these fictions was that notable caricature of religion which their age had directly before its eyes, and to free themselves from which they strained every nerve. With the keen vision of hate they uncovered all the infirmities of religion, all the terrors and iniquities which have followed in its train, all the injurious effects to civilisation which have proceeded from it. They created a negative picture of religion, which has lost nothing of its partial historical truth by the fact that many of its features are farther withdrawn from our immediate experience than they were from that of the times in question.

But it was the nineteenth century that first worked out the true psychology of religious man, and again came into possession of that spirit of congeniality which is absolutely necessary to our entering into the mental life of far-distant times. To the men of the rationalistic age the history of religion was simply the history of the obscuration of the pure, natural religion, which was supposed to be constituted of a rational idea of God and a system of humane ethics, and which was indistinctly conceived at times as the logical, and at times as the historical, antecedent of the concrete religions. The latter appeared as the corruption of the natural and simple order of things—a corruption produced by superstition, by the wily exploitation of human credulity and human needs, by the scheming machinations of the founders of religions and of priests, by human delight in the marvellous, by the falsification of the natural moral sentiments, and by the stirring into life of fanatical passions. We know

to-day that this so-called natural religion is nothing more than a product of late abstraction and reflection; that the motives and selfish interests above cited have been abundantly at work in religious history, but are nevertheless unable to explain the internal motive force and tremendous vitality of these spiritual products. We know to-day that religions spring with the same necessity and in conformity with similar laws from the depths of the human mind as language and art, and that they form an integral constituent part of the structure of civilisation and an important weapon of humanity in the struggle for existence. In symbolical form they embody the highest treasures and highest ideals of national existence; in its gods humanity beholds the imaginative perfection and explanation of its view of the world; and in its religious practices, in its worship, in prayer, it strives to realise the wishes and aspirations which seem to lie beyond the reach of its powers.

Many a riddle still remains to be solved, as is natural in a domain that extends into the most hidden recesses of the human soul, and whose obscurity is augmented by the fact that in the majority of cases the most important and significant elements must be collected with infinite pains from the rubbish of fantastic traditions. But upon the whole the active labors of a century which calls itself with pride "the historical century," have borne their fruits. With respect to the intrinsic character and the significance of religion for civilisation, there is now every reason why a unity of opinion should prevail among all who take their stand on the common ground of modern scientific research, whether they be friends or opponents of religion.

But how does a knowledge of what religion has been in the past affect our estimate of it in the present? Do we approve of an institution or phenomenon, because we understand how it was once possible, nay, must have existed, and what it signified? We understand to-day the Roman law, the Ptolemaic astronomy, the scholastic philosophy, feudalism, and absolute monarchy, thoroughly; we know the conditions which gave rise to them, the necessity of their appearance, and the measure of their performances; but does it occur to us, for these reasons, to perpetuate and make them im-

mortal because they had once an historical significance? What an institution in its essence is, what in past times it has accomplished, is an inquiry that must be conducted with quite different means from that whether it is applicable to a definite present set of relations and necessities. The historian can render this task more easy by teaching us to understand the general laws and necessities of national life from the analogies of the past; but as a prophet he will always be one that looks backwards, and it is ever to be feared that he, too, will see the present in the light of the past. For to him alone does the past lift its obscuring veil, who, forgetful of self and unmindful of sacrifices, can listen to the voices of remote times and peoples, who with a mind of Protean cast has the power to transform his intellectual being into that to which, solely by description, he seeks to give new life and form. The past becomes a part of him; he loves it, he admires it. And from the reanimation of the past in historical pictures to the attempt of a renewal of it in life is but a single step.

Innumerable are those who have succumbed to this temptation. The entire religious tendency of the nineteenth century exhibits this process on a grand scale. This tendency is based on profound antiquarian studies of the past—on that newly awakened historical interest, which aims not only to criticise but to understand religion and ecclesiastical institutions. Much that in the previous century seemed dead or destined to perish, had been restored to life by it. The whole historical structure of the Christian religion, which at the close of the age of rationalism only existed, it would seem, as an artificially preserved ruin, has received, through the instrumentality of these methods of thought, new supports, and has again been made habitable for the human mind. Unmindful of the complaints of churchmen, the future historian of civilisation will have to characterise the second half of the nineteenth century as a period of religious renaissance. And it is no accident, but a symptom of deep import, that this century has completed almost all the great cathedrals which were left unfinished and in partial ruins by the middle ages, and placed them in their colossal grandeur before the world as lasting monuments of its habits and tendencies of thought.

Yet the spirit of science has also not been inactive. Political progress has freed it from the despotic police supervision which even in the eighteenth century heavily oppressed it. In principle at least, freedom of thought and inquiry are to-day acknowledged by all governments, with the single exception of the Roman curia, although in practice there are by no means few efforts made, by influencing its representatives, to have that proclaimed which it is desired should be proclaimed. Infinitely great has the number of workers grown, the instruments of inquiry, the confidence of the human mind in itself, and our power generally. And if formerly people could conceive of no other science than such as stood in the service of the church, to-day science claims it most emphatically and confidently as its privilege and duty to search and test the logical truth of the most sacred traditions, and thus to base the thought of future generations, not on the naïve faith of their fathers, but on the demonstrable truths of actual present knowledge.

II.

Between the two groups of modern humanity, of which the one seeks to retain the Christian religion in its historical form as the precious heritage of the past, and the other to supplant it by a new Idealism formed in harmony with the spirit of science, a third class stands, which plays the part of a mediator. This class concedes that the traditional forms of religion are in great part unadapted to the modern mind, and that historical Christianity is in need of improvement, but contends that religion is an ineradicable constituent of all higher civilisation, and must remain so, and, particularly, that Christianity is the absolute religion, that is to say, that in Christianity as rightly understood and naturally developed all the necessary elements of the true religion of the future are contained.

I should like, in the following pages, to subject the contentions of this mediatory group to a critical examination, and to discuss the question whether it is at all possible for one who resolutely takes his stand on the ground of modern scientific thought, logically to have religion in the historical sense at all.

In effecting a mediation between the religious and scientific views of the world,—views which appear to be separated from each other by a profound intellectual abyss,—two ways may, generally speaking, be pursued. Both have been frequently trodden since the days of rationalism. I shall discuss each separately.

The attempt may be made to resume, in a form more adapted to modern times, the work of the reformers of the sixteenth century; to go back even more thoroughly than they did to the original and simplest forms of Christianity, to remove *in toto* the superstructure which has been reared upon it in the course of time, and to exhibit to humanity "the pure doctrine of Christ" as the source from which to-day, as a thousand years ago, true comfort may proceed, as the simplest, purest, and most exalted expression of the divine and human that has ever yet been discovered. Many of the most erudite workers in the field of critical theology which this century can show have placed themselves in the service of this idea, which is preached with particular enthusiasm by the so-called "free-religious" and Unitarian confessions, and which at times has also exhibited a noble and conciliatory activity in the homiletical work of some mild-minded and liberal clergymen in the evangelical churches. But our special inquiry here must be concerning the logical and scientific foundation of this modernised primitive Christianity, and on this point it must be frankly stated that the more faithfully such a Christianity reflects the biblical character, the remoter it is from our modern thought, and the more it is dominated by modern ways of thinking, the more unhistorical and hence the more unchristian it becomes.

The "pure doctrine of Christ," the genuine, primitive form of Christianity, is a Utopia of biblical criticism. What we actually possess, in the form of historical documents, is that conception of the doctrines and life of Christ which was put in writing several generations after his death, and which, from amid a much greater number of contemporaneous attempts, met by preference with the approbation of the church. It is a hopeless task to attempt from these late records, which betray the most various intellectual influences, to derive the authentic doctrines of the oldest form of Christianity. No method, subjective prepossession only, can here render

a verdict. The things that appear especially consistent and homogeneous to individual theologians and critics are stamped as the genuine utterances of the Master. As every time has done, so ours also constructs its picture of Christ to conform with its wishes and wants.

But granting even that there is nothing objectionable in this, and that this procedure is perfectly justified, a number of difficulties still stand in the way of this movement which have stamped the procedure of even the most ingenious of its representatives as the outcome of pure subjective caprice. All the written sources which we possess of the life and teachings of Christ contain much that is in the highest degree repugnant to the modern mind. I refer particularly to the miracles. The difficulties which they present may be disposed of in various ways; as, to give an example, by the method of the early rationalistic thinkers, who accepted the miracles as facts, but sought to give them a rational explanation, or by that of Strauss, who held that they were the mythical and poetical raiment of religious ideas and sentiments. Yet no art of interpretation will banish from the world that fact which the poet expressed in the words:

"*Das Wunder ist des Glaubens liebstes Kind.*"

The fact that the entire cast of thought and sentiment of early Christianity is saturated with the belief in the marvellous, and with the expectations, nay, with the actual need of miracles, and that this is not an adscititious ornament which can be doffed at pleasure, like a dress which we have outgrown, but is of the very essence of Christianity. Here is rooted that childlike and simple belief in the limitless and God-coercing power of prayer, for which no natural laws nor force of necessity exists, which is omnipotent as the Godhead itself, and as all-powerful as desire. Here is rooted that ardent conviction of the near collapse of the entire world, of the coming kingdom of perfection which shall proceed, not from deeds and thought, but from faith and grace, and shall crown all human desires with glory. And intimately connected with all this stands the idea, visible in the background of all the moral prescripts of the gospels, and painted in the strongest colors, of a system of punishments and re-

wards in the world beyond; which makes of a God of love, a pitiless, infuriate God of vengeance.

These things are so intimately interwoven with the modes of thought of the synoptic writers that it is impossible to separate them therefrom without doing violence to the internal connection of their doctrines. They who seek after a more spiritual conception may, it is true, find it in the gospel of John. But this book is so completely dominated by the metaphysical-religious speculation of the second century, and by the effort to bring the history of the life and doctrines of the Nazarene in the service of the Logos idea, that the modern mind can only with great difficulty find a common ground of understanding with it.

The task of the modern reformers is, for these reasons, a very difficult one. They cannot but concede that Christianity, even in its purely evangelical form, contains much that is foreign to us, and that the elements of which it is composed must in part be excised and in part improved by criticism and interpretation.

But the more the critical sense which is brought to bear upon this task is developed in the spirit of modern scientific thought, the more will historical Christianity shrink to the form of a mere colorless abstraction, and ultimately nothing remains of its exuberant yet visionary mental world but the picture of a philanthropic life joined to a strongly developed consciousness of God, which proclaims a popular morality in commandments and parables. But even this latter is inevitably exposed to the same fate as the other ideas. It is dominated throughout by the extremest notions of rewards and punishments, which the expectation of the doom of the world places in the very immediate future. It is impossible to take the system as a whole, and it must be made the subject of violent interpretation to acquire any fitness for the needs of modern life. Its principles are systematically turned and twisted till they have acquired in some direction practical utility. And who at this day can forget, that this system of morality, wherever and whenever attempts have been made literally and faithfully to imitate it in practical life, has led only to wretched caricatures? Moreover, it is again and again freely remodelled in the spirit of modern ethics, its offensive elements char-

itably cloaked, its useful ones developed to the utmost, and finally here too a complete set of wholly modern ideas consecrated by the borrowed authority of a venerable antiquity.

And therefore I repeat my contention, that the modern reformation, this modern, pure, and scriptural Christianity, will, the honester it is, all the more surely lead its adherents away from Scripture and from Christianity and ultimately bring them to the adoption of a popularly expounded, but philosophically established, ethical system.

I shall now take up the second of the two methods above mentioned. That which we have just considered was known and affected even by the eighteenth century. The discovery of the second is a merit of the present time. The honor belongs in a pre-eminent degree to the speculative philosophy of Germany, and to the intimate relations with theology which this philosophy, especially in the school of Hegel and Schleiermacher, entered into in the first half of the century. (Kant's philosophy was not put to similar use until later.) All these movements, whose rich literary ramifications and development may be followed to the present day in Otto Pfleiderer's excellent and erudite work, "The History of Protestant Theology in Germany Since Kant,"* have also begun in recent times, through Green, Caird, A. Seth, J. Martineau, R. Flint, and F. Robertson, to exert an influence on Anglo-American intellectual life.

The common fundamental feature of this second movement is, that it proposes to accept as pure Christianity, not only the most ancient forms of Christian doctrine accessible to us, but also the entire system of dogmatic thoughts which in the course of the centuries primitive Christianity has produced. Christianity, these men say, has historically existed and acted in these maturer notions. It is not permissible arbitrarily to separate them from it, and to reverse by any authoritative edicts the real historical development. On the contrary, we now may and must continue the process which, by the tenor of dogmatic history, is the process which has continued for centuries, and give to the dogmas the form which best accords with

* Translation published by Swan, Sonnenschein & Co., London, 1891.

modern spiritual needs. To-day as in the days of incipient Christianity, we see by the side of the naïve literal belief, which takes no offence at incomprehensible things if they only suit the needs of its heart, a gnosis arise which strives to reconcile faith and knowledge, religion and intellectual culture; a gnosis which to the unbelieving sceptic quotes the words of the poet:

"Die Geisterwelt ist nicht verschlossen;
Dein Sinn ist zu; dein Herz ist todt!
Auf! bade, Schüler, unverdrossen
Die ird'sche Brust im Morgenroth!"

It is perhaps even more difficult to give a succinct and comprehensive notion of the ideas of this speculative theology, than of the results of the New Testament exegesis of which we spoke above. All gradations are here represented, from tender, conservative regard for the traditional beliefs of the sects and the needs of the pious heart to the boldest speculative interpretations and critical restrictions of dogma, which utterly discard the historical form and hold fast only to a central germinal truth. The present inquiry will restrict itself to those representatives of this gnosis, who as a matter of principle grant the greatest field of action to the rational development of dogma, and represent its philosophical elaboration in its finest and most complicated form. I shall attempt to signalise the ideas which may to-day be designated as the most spiritualised expression of the Christian view of the world.

And first let us hear a greater mind speak. In Ludwig Feuerbach's essays on the nature of religion and Christianity the following sentences occur:

"The Christian religion is the revealed inwardness, the objec-
"tively expressed self of man; the contents of his highest aspira-
"tions; the essence of man purified and freed from the limitations
"of individuality; yet all subjectivised, that is intuited, known, and
"worshipped as a separate, independent entity, wholly distinct from
"himself. Religion is essentially dramatical. God himself is a
"dramatical creation, that is to say, a personal being opposed to
"man. He who takes from religion this idea, takes from it the gist
"of its being, and holds but the *caput mortuum* in his hands."

These sentences of Feuerbach express with the greatest generality and precision the innermost nature of the Christian view of the world. They characterise excellently the point that cannot be given up without destroying the religous view as such. What I refer to is dualism; the dualism of the divine and the human, of the world beyond, and the world that is, of holiness and sin; dualism conceived not merely as a mode of view and of conceptual distinction, as a working contrariety in things that by their nature are one, but as a metaphysical difference, an actual contraposition of two worlds, of two kingdoms of existence, which are totally separate, no matter how extensive the relations of the one to the other may be. Only on such a supposition is that possible which Feuerbach, with inimitable aptness, called "the dramatic element" of religion. The history of humanity, the history of its religious life particularly, is no monologue of humanity with itself into which life and advancement enter solely through the multitude of the ideas created by individuals within the race itself. It is an action or process in a higher sense, an interactivity between two worlds, in which, it is true, humanity, to a certain extent, shapes its own fortunes and destiny, but at the same time is also constantly exposed to the interferences of a power which stands beyond and above it and to which it has to accommodate itself. And whatever artifices and care many of the representatives of the modern gnosis may employ to conceal this fundamental assumption, and to substitute for it the point of view of the immanence of this power in the world, still any radical breach with it is impossible without endangering the very foundations of the religious sense of humanity itself.

The indispensability of this dualistic opposition and separation is equally well exhibited whether we take as our starting-point the existence of the world at large or the individual consciousness of man. The religious mode of view knows of no other way of asserting the rights and activity of the mind in the All than by making all existence assume a personal life in an infinite, self-conscious, and ethically perfect being. The emotions and experiences of one's heart, its vacillations between humility and exaltation, remorse at the consciousness of one's own imperfections, the inspired flight of

the soul to higher realms of existence, appear as the intercourse of man with some extraneous power, allied to man and yet above him, in which the sum of all excellence to which thought and experience have ever led man, has its eternal source.

These ideas constitute the point of view which is decisive of the history of humanity, particularly in what concerns religion. The history of religion is, in accordance with these ideas, conceived as a continuous self-revelation of God in the world of man. True, this view seems to be contradicted by the fact that the self-revelation of this infinitely good power is effected in the case of by far the greater part of mankind in a very insufficient manner—in the form, namely, of crude and superstitious notions which stand in need of constant purification by reason. But the explanation of this fact is sought in the idea of a divine pedagogical training of the human race, and in the theory that religion is not an immediate self-revelation of the absolute, but passes through the medium of the human mind and consequently must be conditioned by its character.

Christianity, now, especially appears as the highest form of this self-revelation of God in humanity, that is to say as the absolute religion, which, in its historical forms, it is true, is as little free from adscititious ornaments and transient obscurations as other religions, yet in its essence can be as little improved as it can be discarded. This innermost essence of Christianity the majority of the representatives of this modern gnosis declare to be the conviction that all men are from the beginning children of God. In this idea two things are contained: submission to the will of God who is conceived as a kind parent and who in pity and love does everything for the best; and the imitation in our own thought and conduct of the ethical perfection conceived incarnate in God. The entering of man into this relation is designated the kingdom of God—a notion which constitutes the ideal goal of history. The condition of mind on which the kingdom of God rests is prefigured in a typical manner in the founder of the Christian religion. His person and his life are a guarantee of the possibility of this ideal, and exhibit at the same time the means of its accomplishment: namely, the helping love of God, which has infused into this one individual the whole plenitude

of its being, so far as this is at all possible with human capacities, that humanity may have in it a direct living picture of the highest fulfilment of its religious and moral destiny. The historical Christ is the ideal of humanity, supported and ensouled by the spirit of God.

The modern gnosis here goes back to the Paulinian interpretation of the Christ-idea. The consideration of the speculative difficulties of the idea of the Trinity is thus rendered superfluous for it. This notion is treated by the majority of its representatives simply as a dogmatic antiquity; its place is taken by the modern ideas of a distinction between the person of Jesus and the principle or spirit of Christianity, which is synonymous with the contrast of the idea and its revelation, the eternal and the temporal, of the inward essence and its historical realisation. That it employs the notions of idea, principle, and essence wholly in a Platonic sense, as the highest metaphysical realities, is self-evident.

More distant still is the attitude which this speculative theology assumes towards another idea which proceeded from the Rabbinical school of thought of Paul: the notion of salvation or redemption in its connection with the expiatory death of Christ. From these conceptions of punitive suffering, of a vicarious atonement of God in his own person—conceptions of such juristical refinement as to be wholly unacceptable to modern modes of thought—the modern gnosis has upon the whole resolutely turned away and taken refuge in that more spiritual and more profound idea which in early Christian times the author of the gospel of St. John promulgated. The death of Christ is redemptive only in the sense in which Christ's total history is redemptive, as the direct and prefigurative incarnation of the true religious relation between God and man. This is, it is true, applicable in a quite special sense to the Death; for it was by this that the eternal truth was manifested, that not only does all salvation accrue to man from the sacrifice of his own self in duteous and patient love, but that all the life of God is an emanation of this self-surrendering excellence, of this bliss of self-sacrifice. Still, there is one thing that is common to all the representatives of this movement as distinguished from the former, and that is this:

they do not content themselves with picturing the activity of Jesus Christ in general outlines solely as one which is blessed and significant by example and doctrine for humanity, but they assume a continuous and active presence of the Christian principle in humanity, by means of which the moral discord in individuals is overcome, and in the personal spiritual life of individuals divine and human nature are united. This is the most speculative interpretation we have of the old dogmatic notion of redemption, which from its original character as a single isolated phenomenon of history has here become the constant activity of a Christian principle, and an ever-living precedent of Christian life.

It would be a prolix and wearisome task to go through in this way the whole dogmatism of this speculative theology. The fundamental ideas which we have discussed will suffice to show the manner in which, on the one hand, it spiritualised the allegorical notions of popular Christianity, but on the other left untouched the gist of the religious view and the dramatical or dualistic opposition of the divine and human. The notions of grace and sanctification, the notion of the church as a living, organised instrument of salvation, spring directly and logically from these fundamental ideas.

In the province of ethics this movement has a much easier task than the churches based on the New Testament. As it seeks to establish, not a primitive Christianity, but a modernised Christianity developed in the spirit of recent times, there is no necessity of its being incommoded by the ethical crudenesses of early Christianity, but it is in the same position to work these crude nessesover critically as it did the asperities of the old dogmas. It can assimilate most of what it needs from modern philosophical ethics, and content itself with giving to what it has thus borrowed a metaphysically religious background derived from dogmatic traditions.

That this modern gnosis is in a constant state of vacillation with respect to the practical things of life, is a necessary consequence of its fundamental assumptions and of its position towards the doctrines of the church. Its foremost representatives acknowledge without any reserve that the true source from which religious emotions and sentiments flow is the symbolic or imaginative faculty of

man. The grandly simple pictures in which the ancient Christian faith found satisfaction are now in the course of time inevitably disintegrated by the critical reason. The speculative theology itself proclaims that its vocation is one of coöperation towards this end. But it maintains nevertheless that the fruits of this work, the speculative interpretation of the dogmas, their exaltation into the sphere of the Idea, are fit only for initiated minds, and are caviare for the general. The general, the people, want and will use religion in the form which its fancy has created, and it cannot be revealed to it in any other. Progressive in its theories, this gnosis is in its ecclesiastical practice thoroughly conservative. It thinks two kinds of thought, and speaks two kinds of languages, according as it finds itself in the pulpit or in the professorial chair. And it is in just this procedure that it assumes a position which it is very difficult to attack. He, who working for a sound and progressive popular enlightenment on the ground of a unitary view of the world, opposes the further use of the antiquated and effete allegories of the old religions, is told that he is behind the times, and that religion, nurtured by the spirit of modern science, has become something different from what it formerly was. In very strict ecclesiastical quarters this gnosis is looked at askance, and accused of insincerity, nay, of secret alliance with unbelief; but the movement never allowed itself to be led astray by these accusations, and has never failed to assert its right of coöperation in the common work of the Christian church. For though it pretends to be in the hands of the thinking theologian a means of bringing into harmony the faith which he must confess and the thought which he cannot abandon, it yet admits, that with the majority of mankind the allegory will always remain an essential element of religion, and that therefore the task of scientific theology can never be to destroy these vessels of religion, but only to exercise a watchful care, that with the form the spirit also may not be lost.

III.

The question now arises,—and this brings us back to the considerations of the first part of this essay,—Does this rationalised

Christianity of to-day really meet the demands of science, and if it does not, is it in the power of the modern scientific world-conception to furnish from its own resources some substitute for the religious views of the past?

My answer to this question will be short and concise; for the existence of *The Monist*, the fundamental idea of its management, and the total character of the efforts which it has hitherto made, speak with sufficient emphasis. And we may, therefore, with the greatest respect for the scientific zeal and the personal ability of many of the representatives of this mediatory theology, say, without further ado: This rationalised Christianity of yours also is myth and symbol; it still adheres to that "dramatic" division of the world which our imaginations produced, and to the metaphysical dualism of God and man; it cannot lift itself to a rigorous conception of the All in One, for which God is in the same sense a simple function of human thought as thought is a function of the human organism. The God on whom all depends in religion, the God whose name is "Father," the God of love and goodness, the God from whom all great thoughts and all grand resolves spring, the God who sanctifies us and lifts us above the earth—to displace this God from the world in which he has no place, into the inward being of humanity seems at this day so strange, nay, inconceivable, only because we have accustomed ourselves (and down to the times of Mill and Feuerbach, even strict monistic thinkers like Spinoza fell victims to this illusion) to mingle together in the idea of God two wholly distinct ideas—the ideas, namely, of nature and of an ethical ideal. To preserve this latter inviolate, and to secure it from all encroachments of human caprice, one thing alone seemed to the naïve dramatic modes of thought of early times a competent safeguard: the ideal must in some locality be real; the highest to which human thought and aspiration can exalt itself must be sought and must exist in some superhuman reality. And what reality could be better adapted to this than one on which even nature was conceived to be dependent? The entire history of the development of the idea of God in the Græco-Roman and Hebrew worlds, the confluence of these two streams of thought in Christian speculation, exhibit in the clearest

possible manner these motives, which here I can only lightly touch upon.

But this combination of the law of nature and the law of ethics in the idea of God, although solving some of the difficulties of humanity, has plunged it into incomparably greater ones. Through all the centuries of Christian thought a succession of desperate attempts may be traced to establish a theodicy, that is to say, attempts to demonstrate the existence in nature and in history of a God which harmonises with the ethical ideal. Even Kant could undertake to demonstrate the "necessary failure of all attempts at a theodicy," and whoever might still have entertained any doubt as to the correctness of this demonstration, such a one must surely have been convinced of it by the scientific development of the past century. That which was indissolubly welded together in the Christian idea of God is to-day disintegrated into its component elements. The Lord *above* nature, the Spirit *behind* nature, have been rendered inconceivable by the modern notions of the conformity to law of all natural occurrences and of the unity of all existence. The spirit immanent in the All no thinker will deny, for this spirit manifests itself in an indisputable manner in the fact that this All is a cosmos, not a chaos, that not only the caprice of chance but also the laws of necessity rule in it, and that the personal self-conscious mind springs from its midst. But from this recognition of mind in the All, there is no bridge that leads to the old idea of God. We cannot worship the All as a moral ideal. We involve ourselves in absurd complications when we attempt to derive the actions of natural events and their conformity to law from ethical categories, and it is no less a desperate undertaking to imagine that we can draw impulses for our moral thought and conduct from nature. The adaptation of means to ends, the teleology, that rules in the All, is veiled for us in the deepest obscurity. All that we can unravel of it has no resemblance to that which, according to our notions, is ethical:

"Denn unfühlend ist die Natur,"

she does not know what love or mercy is; she knows only the omnipotent power of universal laws; she knows only the rights of the

whole, to which she sacrifices with unconcern the individual; she revels in the double pleasure of unceasing creation and unceasing destruction; she arms unpityingly the strong against the weak; in crises of annihilation she restores the disturbed equilibrium of things; but the palm of peace no one has ever seen in her hand. And we? We stand amazed at her might and greatness, at the plentitude of her powers of creation, at her myriad play of forces, at the inexhaustible wealth of the relations with which she binds being to being, creates and mediates contrarieties, and amidst the most varied change and alternation, ever remains one and the same! But our prototype, our God, she can never be. To him we must look up; but on nature, despite her might, despite her stupendous grandeur, we look down. She did not whisper in our ears that in us which is best and highest. That did not come to us from heaven; *we ourselves* won it by hard struggles, by terribly severe, self-imposed discipline. It is not *of* nature; it is *above* nature. Through *us* something has come into the world that before us did not exist—something that the most exuberant creative magic, or nature's grandest mechanical dreams, could never replace. The day on which first a human being pressed his weaker fellow-man to his breast and said, "Brother, not mine, but thy will be done; I will give up my desires that thou also mayst be glad"; the day on which man first lifted up his head and said, "Let us make the world *good* in the likeness of the picture that has become living in us, just as it should be"; this is the great and sanctified day in the history of our race on earth, the Christmas day on which God was born. But not as the religious fancy has expressed it, the day on which God became man, but the day on which man began to become God, that is the day on which he began to feel spiritual powers in his breast that transcended his animal impulses—powers to which the majority of humanity was still as remote as heaven from earth.

This strict anthropological conception of God as the ideal which is always newly creating itself in the struggles of humanity, which is no Being but a Becoming, solves the innumerable difficulties which the idea of God has hitherto placed in the way of rigorous scientific knowledge and the construction of a unitary conception of

the world. This God has nothing to do with the All. We need not seek him in the All or behind the All, and need not fear that any progress of our knowledge will make his existence a matter of doubt with us. Concerning the real validity of this idea we need not bother ourselves with more or less weak and insufficient demonstrations: the whole history of humanity is evidence of it if we but know how to rightly interpret it, and the stumbling block of the old theological idea of God has become the corner-stone upon which the new scientific conception is built.

Nature and human history the work of an omnipotent and all-kind being that is mediately and immediately active in all events, nay, sacrificed himself in his own person that he might realise in this world his purposes! Compare the principle, the active force of this world-drama, pictured by the religious fancy as the highest power, the highest wisdom, and all-merciful love, with the real spectacle of the world! Is there anywhere a more pronounced contradiction, an obscurer riddle, a more inconceivable contrast between purpose and accomplishment? This world of cruelty and woe, in which one creature feeds on the heart-blood of another, in which here and there from seas of mud and dirt a form of light springs up, in which every nobler production must be bought with torrents of blood and tears; this revelation and self-manifestation of God in humanity, which everywhere appears joined to definite historical suppositions, which lacks all the conditions of true universality and of indisputable evidence, so that instead of forming a means of union it has become the source of dreadful contentions; this work of salvation and sanctification which is so restricted in its effects that "the kingdom of God" is still a dreamy vision of humanity, so restricted that we still see the majority of men, despite the most extraordinary supernatural dispositions, still remain far behind the simple ideals of natural ethical commandments, that hate and dissension, cruelty and selfishness, perform their unhallowed work—is this the work of infinite power and infinite wisdom? What claims theodicy makes on human thought! And how different the picture is, the moment we abandon the false theocentric point of view and assume the anthropocentric! Instead of a belief which all facts contradict—an

idea which elucidates them all. No one can say how we are to interpret facts as the work of a holy and absolutely perfect being; but it can be shown, step by step, how in this, our human world, more perfect things spring from imperfect things, moral and mental laws from the blind play of natural forces and powers, the conscious energy of will from blind and unreasonable impulse, law and love of man from the selfishness and warring of all against all, and the notion of the unity of the race from infinite disruption and disunion. We must not allow ourselves to be led astray or discouraged here by the changing undulations and tremendous crises of this battle for the good. The ideal springs out of a dark abyss. The roots of our being are deep laid in nature, yet we struggle to exalt ourselves above it. No wonder, therefore, that time and again it draws us back.

The greatest and sublimest spectacle! A tragical one, one filled with struggle and suffering, and yet one infinitely full of hope. For it shows us the inexhaustible grandeur of the human mind; it shows us the good, the ideal, as a tremendous real power, a power eternally becoming, surely forming itself out of an infinitude of individual deeds, a power fully incarnate in no one person, yet active and living in humanity. Not a tangible activity, and yet one of the realest of facts. A supersensuous, nay, if you will, a supernatural realm of thought; not the faded reflection or shadow of a grandeur and power beyond us, but the fruit of the noblest activities and powers of this given, existing world, antagonised in life, but grand and powerful in thought; imperfect even in its boldest flights, but bearing within it the germ of greater things to come.

Here is the true point of union for Christian dogma and science. Here is the God in which science also may, nay, must, believe. Not humanity in its empirical reality, but the ideal world developed within the human realm of things—the spirit of humanity. This is the only true object of worship. Before it we are humiliated, and by it we feel ourselves exalted. From it we receive all the good that life bestows upon us; it gives us light and peace and lucid thought. And what higher, nobler thing can a life produce than the feeling that it has not been unworthy of this great ancestry, that it has

helped to keep alive this holy fire, that it has helped, perhaps, to fan by its own life this living flame to greater heights?

Here is the true source of the ideas of accountability and of salvation. We are not responsible to a being outside and above us, but to our own selves and to humanity, from which we have received the best that it had to give, and for which we must return what we ourselves have produced. This consciousness of being thrown utterly on the resources of one's own self, on one's own powers, was first created in the human mind by science and the technical arts, (as that most venerable and most sacred of all myths, the legend of Prometheus, so profoundly indicates,) and this consciousness will, by the progress of knowledge and power, be made more and more the dominating one of humanity. This is not a consciousness of omnipotence; it does not exclude the subjection of man to the inexorable laws of the universe; but it demands the enlistment of all the powers of the race: for nature does not give us more than we wrest from her by arduous toil.

And as humanity is accountable only to itself, so do the means of its salvation lie only in itself. Not in any one individual, but in the spirit in it which ever works onward and upward. Yet this spirit is not an unpersonal existence; it must be possessed again and ever again by living men. And no one can serve humanity or augment its spiritual treasures or reincarnate in himself its holiest possessions without first having and feeling within himself the blessing of what he has done. And thus the profoundest significance of human life on earth may be formulated and embraced in that saying of the poet which was throughout conceived in the spirit of our times, and would have been wholly incomprehensible to the mind of those who gave us our faith—in the words:

"*Erlösung dem Erlöser.*"

F. Jodl.

THE RELIGION OF SCIENCE.

ARE religion and science indeed as contrary as they are often represented to be, and is the proposition to reconcile them a hopeless and futile undertaking? Professor Jodl, in his article "Religion and Modern Science," (pp. 329–351 of this number,) says:

"That civilised humanity to-day is separated into two groups which no longer understand each other, which do not speak the same language, and which live in totally different worlds of thought and sentiment."

There are those who cling to the old religions and those who supplant it by a new idealism. Between both, he adds:

"A third class stands which plays the part of a mediator."

Professor Jodl does not approve of reconciling the historical forms of religion with science. He rightly says:

"The 'pure doctrine of Christ,' the genuine, primitive form of Christianity, is a Utopia of biblical criticism."

We heartily agree with him in his remarks concerning the part which the miraculous and supernatural play in the Gospels:

"These things are so intimately interwoven with the modes of thought of the synoptic writers that it is impossible to separate them therefrom without doing violence to the internal connection of their doctrines."

We also concur upon the whole with Professor Jodl in his criticism of the methods of Speculative Theology. No compromising with traditional errors, no covering or extenuating of the results of historical criticism is allowable merely for the love of tradition and for the preservation of errors that have become dear to a large number of people.

We do not condemn the work of any mediator; on the contrary, we rather encourage it. We observe with pleasure in the latest phases of the religious evolution of Speculative Theology the prevalence of a more modern spirit, and we follow with a keen interest also the progress of biblical critique in its truly valuable labors: but we do not expect that either the one or the other will accomplish any regeneration of religion.

Professor Jodl knows very well that the editors of *The Monist* and *The Open Court* have not undertaken any work of compromising between the errors of the past and the ideal of the future. Our idea of a reconciliation between religion and science is of a different nature. We are not blind to the errors of the old religions, and we do not mean to gloss them over, or to make old-fashioned views acceptable by presenting them in a new garment. We do not even stop to bury the dead, for we have better things to do than to trouble with problems that have been definitely settled. We keep our hands to the plough to accomplish the work needed to-day.

While we are not blind to the errors of the old religions, we recognise at the same time that they contain in the language of parables some great truths which will remain forever. These truths constitute the backbone of religion, and we regard it as a very important duty of ours to preserve them. These truths must be preserved, not because they were believed in by our fathers, nor from any respect for tradition, nor from any regard for our sentiments, but simply because they are truths, because they can be proved to be true according to the methods of scientific inquiry.

What is religion? Religion consists of all those ideas which regulate our conduct. In the savage these ideas are very crude and superstitious, and often self-contradictory. The higher a man rises, the clearer, the more scientific and consistent do these ideas become, until they develop into a systematic world-conception. Every scientific idea that changes our world-conception will change also our religion and with it our rules of conduct. Thus, for example, the idea of evolution has become to us an eminently religious idea.

In order to indicate that the criterion of truth for religion is the very same thing as the criterion of truth for science, we have pro-

posed to call the religion we advocate, "The Religion of Science." (For details see the editorial of Vol. VII, No. 1, of *The Open Court.*)

Our procedure appears to many as an annihilation of religion in favor of science. But it is not. And why not?

We have learned many truths first from religion, long before science could ever think of proving them. In several respects science took the lead, and religion remained at a long distance behind, awkwardly, very slowly, and unwillingly limping onward on the road of progress. Instances are, the acceptance of the Copernican system and of the evolution theory. But in other respects religion took the lead, and science was unable to follow its ingenious flight. As instances of this we cite such moral truths as the love of enemies, which were not preached by scientists as scientific truths, but by religious teachers, by Confucius, Buddha, and Christ. There are scientists even to-day who regard what we would call "moral truths" as maxims that are contrary to the established views o science. Professor Huxley, for instance, is very emphatic in his declaration that the facts of nature do not teach morality.*

This leads us to a point in which we disagree with Professor Jodl. He speaks of the illusion "of mingling together in the idea of God two wholly distinct ideas—the ideas namely of nature and of an ethical ideal"—an illusion to which "even strict monistic thinkers like Spinoza fell victims."

Professor Jodl's position reminds us of John Stuart Mill's "Essay on Nature," in which he exposes the old doctrine *naturam sequi* in all its absurd meanings and carefully avoids a discussion of the only rational conception of the precept. Thus his tirades appear most convincing, and to be sure they are quite correct—so far as they go. Says Mill:

"In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another, are nature's every-day performances. Killing, the most criminal act recognised by human laws, Nature does once to every being that lives. . .

"Nature impales men, breaks them as if on the wheel, casts them to be devoured by wild beasts, burns them to death, crushes them with stones like the first Christian martyr, starves them with hunger, freezes them with cold, poisons them

* For a discussion of this point see *Fundamental Problems*, pp. 219–226.

by the quick or slow venom of her exhalations, and has hundreds of other hideous deaths in reserve, such as the ingenious cruelty of a Nabis or a Domitian never surpassed."

Mill must indeed have felt the need of beginning these sentences with the words "In sober truth"; otherwise he might be suspected of humor.

Similarly comical is Mill's proposition to regard every voluntary action of man as a direct infringement upon nature. Man's reason in that case would be the most unnatural phenomenon in the world, and the term "nature" would be confined to the lowest realms of existence exclusively. If the usage of reason were indeed an infringement upon nature, man's appearance upon earth would mark the beginning of a supernatural realm; and Professor Jodl seems to accept this consequence when he says:

"It is not *of* nature, it is *above* nature."

If man's rationality and his ethics were not born of nature, if their conditions were not founded in the very existence of nature, if they were not the natural product of evolution, then indeed I see no escape from a dualistic world-conception, in which a supernatural God introduces the spark of divinity which appears in the soul of man from spheres beyond.

We have devoted to these vagaries of John Stuart Mill an elaborate discussion in another place and do not feel the need of repeating our arguments in this connection.*

We agree with Professor Jodl that no rationalising of old dogmas will help us in the establishment of "a new idealism, formed in harmony with the spirit of science." We must build our religion anew (as every generation had to build its religion anew) out of the best materials which are furnished by the maturest and most reliable knowledge of to-day. Says Professor Jodl:

"Through *us* something has come into the world that before us did not exist—something that the most exuberant creative magic, or nature's grandest mechanical

* See the article in Nos. 239, 241, and 242 of *The Open Court: Nature ana Morality*. An Examination of the Ethical Views of John Stuart Mill. I. The Meaning of Basing Ethics Upon Nature. II. The Ethics Taught by Nature. III. Intelligent Action and Moral Action. IV. The Anthropomorphic Standpoint of Mill.

dreams, could never replace. The day on which first a human being pressed his weaker fellow-man to his breast and said, "Brother, not mine, but thy will be done; I will give up my desires that thou also mayst be glad"; the day upon which man first lifted up his head and said, "Let us make the world *good* in the likeness of the picture that has become living in us, just as it should be"; this is the great and sanctified day in the history of our race on earth, the Christmas day on which God was born."

Certainly the origin of man on earth, and again the evolution of the moral man, is something quite new, which before did not exist. But did humanity originate out of nothing, as sometimes the imaginations of a poet are supposed to be created, or is there a prototype in whose image man has been created? Man's reason, his ethics, and his humanity are something that did not exist before, but there is a feature in existence which makes it possible that rational and moral beings develop. Should there be sentient beings on other planets, and we have little reason to doubt it, we can be sure that they also will develop rational minds, and that they also will learn, perhaps as we did, through many bitter experiences, the same truths which constitute our main maxims of morality,* including such precepts as the love of enemies. And why are we sure that on other planets not only reason, but also the fundamental rules of ethics will be the same as with us here on earth? Simply because we know that there is a certain feature in reality which creates rational beings and moral beings as naturally as it creates rocks and seas on the surface of planets. Man's reason and also man's morality are not original inventions of his, but the result of many experiences which he had to learn. And the world in which he lives is such that he can acquire reason and morality, and if a being should acquire a wrong kind of reason or a wrong kind of morality, it will by and by be blotted out of existence. Accordingly there is a prototype of reason and of morality, and this prototype of the humanity of man is exactly that which in the language of the old religions has received the name "God."

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* I purposely do not say *all* maxims of conduct, because we can very well imagine that different conditions may produce some very important variations in the rules of conduct; but the main foundation of morality would be the same.

We must make a distinction between ideals and dreams. Those creations of our fancy which are woven without any regard to reality are dreams. They have no value beyond whiling away a leisure hour or pleasing our imagination. But those creations of our mind which construct realisable formations such as machines or clocks or higher conditions of human society, are not mere dreams, they are ideals. What, then, is the difference between a dream and an ideal? A dream is a useless ebullition of an idle brain composed of ideas to which there is no correspondent reality; but an ideal is a potent factor in the living presence to shape the future: it is a combination of ideas which are correct descriptions of actual realities. The moral aspirations of mankind are not empty dreams, they are true and veritable ideals. There are certain qualities in nature which make their realisation possible and these qualities constitute the Divinity of nature.

Professor Jodl speaks of the origin of morality as of the birth of God on earth. Truly that is the meaning of Christianity. But this birth of God into the world of human evolution as "the Son of Man" is possible only because of the existence of the God in nature whom Christian mythology so beautifully calls God the Father. The appearance of the Son of Man upon earth, the birth of morality, is a revelation of the divinity of nature.

True enough, as Professor Jodl says, that we ourselves won the best and highest we have by hard struggles, by terribly severe, self-imposed discipline. As Prometheus says:

"Hast du nicht alles selbst vollendet,
Heilig glühend Herz!"

That, too, is part of the divinity of nature, that every creature has to work out its very being itself, and that man must search for the way of salvation with great anxiety, under bitter tribulations and through extreme afflictions. But he cannot invent a new way of salvation, he has to find it, and there is but one that is the right one. The nature of morality is such as it is, and no other morality could be invented to replace it. And this feature of existence which makes morality quite a determined thing is a real presence in the world, it is an actual quality of the universe.

Some of our liberal friends, foremost among them Professor Haeckel, deny the existence of a personal God and then proceed to declare that the God of science is nothing but matter and energy. We agree with Professor Haeckel in his rejection of anthropotheism; God is no supernatural being nor is he a huge world-ego. But we cannot accept his view of God as being only matter and energy. The idea of God is and always has been a moral idea. Thus we have come to regard all those features of nature as divine which condition the origin and existence of morality and we define God as the authority of moral conduct. This authority is not a person, not a sentient being, let alone a sentimental philanthropist; but it is, nevertheless, a reality, and, indeed, a stern reality.

Such is the God of science. God is that quality of existence through which we originated as feeling, thinking, and aspiring beings. He is the prototype of the human soul, and the condition under which develop man's reason and morality. Obedience to him is indispensable for a continued existence, for further progress and a higher evolution of the human soul. That these features of reality can by a great number of keen and fearless modern thinkers be supposed to be a non-entity is difficult to understand. This negation of the reality of qualities of existence which are not individual things but intrinsically inherent in all the individual things, it appears to us, is an old heirloom of nominalism. The nominalistic philosophy represented by Roscellinus was suppressed at the council at Soissons 1092, only to rise more powerfully in the fourteenth century in William of Occam, and finally to exterminate realism with all its rubbish of errors together with the truth contained in these errors. Kant marks in many respects the culmination of the victorious movement of nominalism. With all the benefits modern thought derived from the philosophical work of nominalism, a reaction is needed against its purely negative spirit. There is a truth in the old realism which cannot be neglected with impunity.*

* There are two men at present who boldly fly the flag of the old realism again, both having our full sympathy in their aspirations, although we cannot agree with many of their teachings. The one is Mr. Charles S. Peirce, the other Dr. Francis E. Abbot.

God (viz., the name of God) is, as Kant said, a noumenon, a thing of thought, an abstraction. God is not a thing, a concrete object, or an individual person. All the views of God which regard him as an individual being of some kind, or as a person only of in finite dimensions, are, closely considered, pagan notions which belittle God. But the name of God as a noumenon, a thought, an abstract idea, has a meaning. Abstract ideas are not nonentities they represent some real features, some actual qualities, or properties, or relations; otherwise they would not be ideas, but unmeaning sounds.

Some of our abstract ideas are of a very delicate fibre, so that the coarse mental vision of the average Philistine is unable to see them in their reality and potency. But it so happens that exactly they are of a more important, more powerful, and inevitable presence than the simple generalisations of things that visibly and corporeally surround us. This, their peculiar nature, makes such ideas mysterious to those who instinctively feel their reality without being able to point it out and understand it. And the most subtle, imponderous, and sublimated of all ideas is the idea of God.

We have defined God as the ultimate authority of conduct, as the condition of our existence as rational and moral beings, as the all-power that enforces obedience, etc.; but we cannot in any one of our definitions exhaust the significance of the idea. We would by no means exclude from the idea of God anything without which reality would cease to be real. The qualities of matter and energy constitute that element in the God-idea which justify the old religions in speaking of him as omnipotent and everlasting. Thus they ought not to be excluded. But these qualities alone are insufficient to characterise his being. The sum-total of matter and energy as such and as such alone does not constitute any moral authority. Nature in her immeasurable greatness and oppressive vastness affects us with awe; but, after all, we look down upon her massive sublimity. Man is more than the biggest heap of crude matter and unintelligently operating energy. Says Professor Jodl:

"We stand amazed at her might and greatness, at the plentitude of her powers of creation, at her myriad play of forces, at the inexhaustible wealth of the relations

with which she binds being to being, creates and mediates contrarieties, and amidst the most varied change and alternation, ever remains one and the same! But our prototype, our God, she can never be."

This grandeur of nature is part of her divinity, but it alone does not constitute the character of God. Yet, observe that throughout nature there is an imponderable quality present which makes every atom move in a definite way, so that the whirl of gaseous masses, apparently a chaos, will be recognised as a cosmic whole developing in a certain way and describable in what is generally called natural laws. This subtle quality is the condition of the regularities which are found in all the infinite varieties and innumerable particularities, and all these regularities conceived in their systematic unity are called the order of the universe.

Man exists as a thinking being only because the immeasurable universe of which he is a part possesses this quality of order, and his reason is closely considered only a copy of it. Man's reason was shaped into the image of the cosmic order, and suppose—a supposition which is very difficult to make and regarded by many as impossible or inconceivable—yet suppose that the world-order were radically different from what it actually is, man's reason would accordingly be different too. Further, suppose that the whole frame and fundamental interrelations of the particles of reality were different from what they are, would not correspondingly the basic rules of conduct be changed too?

The author of this article, in the eyes of the so-called orthodox Christian, is most certainly an atheist. And if theism means the belief in a personal or extramundane God he is an atheist indeed. If there is any opprobrium in the name atheism we are willing to accept it; and certainly, we do not reject the label of atheism in order to escape any odium attached to that name. We do reject atheism simply because we see a great and potent truth in the idea of God which is but too often disregarded.

With Professor Haeckel and Professor Jodl we reject the conception of an anthropomorphic Deity. The anthropomorphic idol is doomed before the tribunal of science. But we see a deeper meaning in the idea of God which has formed through millenniums the

very centre of the greatest religions on earth. Science has to recognise the reality of an all-presence in existence which is analogous to that which in a religious language is called God.

Considering the fact that humanity owes many great truths to religion, let us not be hasty in condemning the religions of the past as pure superstition. There are valuable seeds in the chaff. If we discard the wheat together with the tares, we shall have to rediscover them, for it is little probable that humanity can for any length of time be satisfied with beautiful phrases or live in its moral aspirations in a realm of mere dreams.

EDITOR.

THE SUPERSTITION OF NECESSITY.*

LEST my title give such offense as to prejudice unduly my contention, I may say that I use the term in the way indicated by its etymology: as a standing-still on the part of thought; a clinging to old ideas after those ideas have lost their use, and hence, like all superstitions, have become obstructions. For I shall try to show that the doctrine of necessity is a survival; that it holds over from an earlier and undeveloped period of knowledge; that as a means of getting out of and beyond that stage it had a certain value, but, having done its work, loses its significance. Halting judgment may, indeed, at one time have helped itself out of the slough of uncertainty, vagueness, and inadequacy on to ground of more solid and complete fact, by the use of necessity as a crutch; once upon the ground, the crutch makes progress slower and, preventing the full exercise of the natural means of locomotion, tends to paralyse science. The former support has become a burden, almost an intolerable one.

The beginning of wisdom in the matter of necessity is, I conceive, in realising that it is a term which has bearing or relevancy only with reference to the development of judgment, not with reference to objective things or events. I do not mean by this that necessity refers to the compelling force with which we are driven to make a given affirmation: I mean that it refers to the content of that affirmation,

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* This article, as the title may indicate, was suggested by Mr. Peirce's article upon "The Doctrine of Necessity Examined." As, however, my thought takes finally a different turn, I have deemed it better to let it run its own course from the start, and so have not referred, except indirectly, to Mr. Peirce's argument. I hope this will not be taken as a desire to slur over my indebtedness to him.

expressing the degree of coherence between its constituent factors. When we say something or other *must* be so and so, the "must" does not indicate anything in the nature of the fact itself, but a trait in our *judgment* of that fact; it indicates the degree with which we have succeeded in making a whole out of the various elements which have to be taken into account in forming the judgment. More specifically, it indicates a half-way stage. At one extreme we have two separate judgments, which, so far as consciousness is concerned, have nothing to do with each other; and at the other extreme we have one judgment into which the contents of the two former judgments have been so thoroughly organised as to lose all semblance of separateness. Necessity, as the middle term, is the midwife which, from the dying isolation of judgments, delivers the unified judgment just coming into life—it being understood that the separateness of the original judgments is not as yet quite negated, nor the unity of the coming judgment quite attained. The judgment of necessity, in other words, is exactly and solely the transition in our knowledge from unconnected judgments to a more comprehensive synthesis. Its value is just the value of this transition; as negating the old partial and isolated judgments—in its backward look—necessity has meaning; in its forward look—with reference to the resulting completely organised subject-matter—it is itself as false as the isolated judgments which it replaces. Its value is in what it rids judgment of. When it has succeeded, its value is nil. Like any go-between, its service consists in rendering itself uncalled for.

All science can ultimately do is to report or describe, to completely state, the reality. So far as we reach this standpoint regarding any fact or group of facts, we do not say that the fact *must* be such and such, but simply that it *is* such and such. There is no necessity attaching to the fact either as whole or as parts. *Qua* whole, the fact simply is what it is; while the parts, instead of being necessitated either by one another or by the whole, are the analysed factors constituting, in their complete circuit, the whole. In stating the whole, we, as of course, state all that enters into it; if we speak of the various elements as *making* the whole, it is only in the sense of making it *up*, not of causing it. The fallacy of the ne-

cessitarian theory consists in transforming the determinate in the sense of the wholly defined, into the determined in the sense of something externally made to be what it is.

The whole, although first in the order of reality, is last in the order of knowledge. The complete statement of the whole is the goal, not the beginning of wisdom. We begin, therefore, with fragments, which are taken for wholes; and it is only by piecing together these fragments, and by the transformation of them involved in this combination, that we arrive at the real fact. There comes a stage at which the recognition of the unity begins to dawn upon us, and yet, the tradition of the many distinct wholes survives; judgment has to combine these two contradictory conceptions; it does so by the theory that the dawning unity is an effect necessarily produced by the interaction of the former wholes. Only as the consciousness of the unity grows still more is it seen that instead of a group of independent facts, held together by "necessary" ties, there is one reality, of which we have been apprehending various fragments in succession and attributing to them a spurious wholeness and independence. We learn (but only at the end) that instead of discovering and then connecting together a number of separate realities, we have been engaged in the progressive definition of one fact.

There are certain points upon which there is now *practical* agreement among all schools. What one school has got at by a logical analysis of science, another school has arrived at by the road of a psychological analysis of experience. What one school calls the unity of thought and reality, another school calls the relativity of knowledge. The metaphysical interpretation further given to these respective statements may be quite different, but, so far as they go, they come to the same thing: that objects, *as known*, are not independent of the process of knowing, but are the content of our judgments. One school, indeed, may conceive of judgment as a mere associative or habitual grouping of sensations, the other as the correlative diversification and synthesis of the self; but the practical outcome, that the "object" (anyway as known) is a form of judgment, is the same. This point being held in common, both schools must agree that *the progress of judgment is equivalent to a change in*

the value of objects—that objects as they are for us, as known, change with the development of our judgments. If this be so, truth, however it be metaphysically defined, must attach to late rather than to early judgments.

I am fortunate in being able to quote from authors, who may be taken as typical of the two schools. Says Professor Caird in his article upon "Metaphysic," (lately reprinted, "Essays in Philosophy and Literature,"):

"Our first consciousness of things is not an immovable foundation upon which science may build, but rather a hypothetical and self-contradictory starting-point of investigation, which becomes changed and transformed as we advance." ("Essays," Vol. II, p. 398.)

On the other hand, Mr. Venn writes (in the first chapter of his "Empirical Logic"):

"Select what object we please—the most apparently simple in itself, and the most definitely parted off from others that we can discover—yet we shall find ourselves constrained to admit that a considerable mental process has been passed through before that object could be recognised as being an object, that is, as possessing some degree of unity and as requiring to be distinguished from other such unities."

He goes on to illustrate by such an apparently fixed and given object as the sun, pointing out how its unity as a persistent thing involves a continued synthesis of elements very diverse in time and space, and an analysis, a selection, from other elements in very close physical juxtaposition. He goes on to raise the question whether a dog, for example, may be said to "see" a rainbow at all, because of the complex analysis and synthesis involved in such an object. The "mental whole" (to use Mr. Venn's words, the "ideal unity" as others might term it) is so extensive and intricate that

"One might almost as reasonably expect the dog to 'see' the progress of democracy in the place where he lives, of which course of events the ultimate sensible constituents are accessible to his observation precisely as they are to ours."

As Mr. Venn is not discussing just the same point which I have raised, he does not refer to the partial and tentative character of our first judgments—our first objects. It is clear enough, however, that there will be all degrees between total failure to analyse and com-

bine (as, say, in the case of the dog and rainbow) and fairly adequate grouping. The difference between the savage whose synthesis is so limited in scope that he sets up a new sun every day and the scientific man whose object is a unity comprehending differences through thousands of years of time and interactions going on through millions of miles of space is a case in point. The distinction between the respective objects is not simply a superimposition of new qualities upon an old object, that old object remaining the same; it is not getting new objects; it is a continual qualitative reconstruction of the object itself. This fact, which is the matter under consideration, is well stated by Mr. Venn, when he goes on to say:

"The act of predication, in its two-fold aspect of affirmation and denial, really is a process by which we are not only enabled to add to our information *about* objects, *but is also the process by the continued performance of which the objects had been originally acquired, or rather produced*" (italics are mine).

This statement cannot be admitted at all without recognising that the first judgments do not make the object once for all, but that the continued process of judging is a continued process of "producing" the object.

Of course the confused and hypothetical character of our first objects does not force itself upon us when we are still engaged in constructing them. On the contrary, it is only when the original subject-matter has been overloaded with various and opposing predicates that we think of doubting the correctness of our first judgments, of putting our first objects under suspicion. At the start, these objects assert themselves as the baldest and solidest of hard facts. The dogmatic and naïve quality of the original judgment is in exact proportion to its crudeness and inadequacy. The objects which are the content of these judgments thus come to be identified with reality *par excellence*; they are *facts*, however doubtful everything else. They hang on obstinately. New judgments, instead of being regarded as better definitions of the actual fact and hence as displacing the prior object, are tacked on to the old as best they may be. Unless the contradiction is too flagrant, the new predicates are set side by side with the old as simply additional information; they do not react into the former qualities. If the contradiction is

too obvious to be overlooked the new predicate is used, if possible, to constitute another object, independent of the former. So the savage, having to deal with the apparently incompatible predicates of light and darkness, makes two objects; two suns, for two successive days. Once the Ptolemaic conception is well rooted, cycles and epicycles, almost without end, are superadded, rather than reconstruct the original object. Here, then, is our starting point: when qualities arise so incompatible with the object already formed that they cannot be referred to that object, it is easier to form a new object on their basis than it is to doubt the correctness of the old, involving as that does the surrender of the *object* (the fact, seemingly) and the formation of another object.

It is easier, I say, for there is no doubt that the reluctance of the mind to give up an object once made lies deep in its economies. I shall have occasion hereafter to point out the teleological character of the notions of necessity and chance, but I wish here to call attention to the fact that the forming of a number of distinct objects has its origin in practical needs of our nature. The analysis and synthesis which is first made is that of most practical importance; what is abstracted from the complex net-work of reality is some net outcome, some result which is of value for life. As Venn says:

"What the savage mostly wants to do is to produce something or to avert something, not to account for a thing which has already happened. What interests him is to know how to kill somebody, not to know how somebody has been killed." (P. 62 of "Empirical Logic.")

And again:

"What not only the savage, but also the practical man mostly wants, is a *general* result, say the death of his enemy. It does not matter whether the symptoms, i. e., the qualifying circumstances, are those attendant on poison, or a blow from a club, or on incantation, provided the death is brought about. But they do desire *certainty* in respect of this general result." (P. 64.)

Now it is this "general result," the net outcome for practical purposes, which is *the* fact, *the* object at first. Anything else is useless subtlety. That the man is dead—that is the fact; anything further is at most external circumstances which happen to accompany the fact. That the death is only a bare fraction of a fact; that

the attendant "circumstances" are as much constituent factors of the real fact as the mere "death" itself (probably more so from the scientific point of view)—all this is foreign to conception. We pluck the fruit, and that fruit is the fact. Only when practical experience forces upon us the recognition that we cannot get the fruit without heeding certain other "conditions" do we consent to return upon our assumed object, put it under suspicion and question whether it is really what we took it to be. It is, we may presume, the savage who in order to get his living, has to regulate his conduct for long periods, through changes of seasons, in some continuous mode, who first makes the synthesis of one sun going through a recurring cycle of changes—the year.

As time goes on, the series of independent and isolated objects passes through a gradual change. Just as the recognition of incompatible qualities has led to setting up of separate things, so the growing recognition of similar qualities in these disparate objects begins to pull them together again. Some relation between the two objects is perceived; it is seen that neither object is just what it is in its isolation, but owes some of its meaning to the other objects. While in reality, (as I hope later to point out,) this "relationship" and mutual dependence means membership in a common whole, contribution to one and the same activity, a midway stage intervenes before this one fact, including as parts of itself the hitherto separate objects, comes to consciousness. The tradition of isolation is too strong to give way at the first suggestion of community. This passage-way from isolation to unity, denying the former but not admitting the latter, is necessity or determinism. The wall of partition between the two separate "objects" cannot be broken at one attack; they have to be worn away by the attrition arising from their slow movement into one another. It is the "necessary" influence which one exerts upon the other that finally rubs away the separateness and leaves them revealed as elements of one unified whole. This done, the determining influence has gone too.

The process may be symbolised as follows: M is the object, the original synthesis of the elements seen to be of practical importance; a, b, c, etc., to h are predicates of constantly growing incompatibil-

ity. When the quality *i* is discovered, it is so manifestly incompatible with *a* that all attempt to refer it to the same subject *M* is resisted. Two alternatives are now logically open. The subject-matter *M*, as the synthesis of the qualities *a*—*h*, may be taken up; it may be asked whether the object is really *M* with these qualities; whether it is not rather Σ, having instead of the predicates *a*, *b*, etc., the qualities $\rho\alpha$, $\rho\beta$, with which the new quality *i* is quite compatible. But this process goes against the practical grain of our knowledge; it means not only that we do not know what we thought we knew; it means that we did not *do* what we thought we did. Such unsettling of action is hardly to be borne. It is easier to erect a new object *N*, to which the more incompatible predicates are referred. Finally, it is discovered that both *M* and *N* have the same predicates *r* and *s*; that in virtue of this community of qualities there is a certain like element even in the qualities previously considered disparate. This mutual attraction continues until it becomes so marked a feature of the case that there is no alternative but to suppose that the *r* and *s* of one produces these qualities in the other, and thereby influences all the qualities of the other. This drawing together continues until we have the one reconstructed object Σ, with the traits $\rho\alpha$, $\rho\beta r$, etc. It is found that there is one somewhat comprehensive synthesis which includes within itself the several separate objects so far produced; and it is found that this inclusion in the larger whole reacts into the meaning of the several constituting parts—as parts of one whole, they lose traits which they seemed to possess in their isolation, and gain new traits, because of their membership in the same whole.

We have now to consider, more in detail, how the intermediate idea of necessity grows up and how it gives away upon the discovery of the one inclusive whole. Let us continue the illustration of the killing. The "general result," the death of the hated enemy, is at first the fact; all else is mere accidental circumstance. Indeed, the other circumstances at first are hardly that; they do not attract attention, having no importance. Not only the savage, but also the common-sense man of to-day, I conceive, would say that any attempt to extend the definition of the "fact" beyond the mere

occurrence of the death is metaphysical refinement; that the *fact* is the killing, the death, and that that "fact" remains quite the same, however it is brought about. What has been done, in other words, is to abstract part of the real fact, part of *this* death, and set up the trait or universal thus abstracted as itself *fact*, and not only as fact, but as *the* fact, *par excellence*, with reference to which all the factors which constitute the reality, the concrete fact, of *this* death, are circumstantial and "accidental."*

A fragment of the whole reality, of the actual fact individualised and specified with all kind of minute detail, having been thus hypostatised into an object, the idea of necessity is in fair way to arise. These deaths in general do not occur. Although the mere death of the man, his removal from the face of the earth, is the *fact*, none the less all *actual* deaths have a certain amount of detail in them. The savage has to hit his enemy with a club or spear, or perform a magic incantation, before he can attain that all-important end of getting rid of him. Moreover, a man with a coat of armor on will not die just the same way as the man who is defenseless. These circumstances have to be taken into account. Now, if the "fact" had not been so rigidly identified with the bare practical outcome, the removal of the hated one, a coherent interpretation of the need for these further incidents would be open. It could be admitted that the original death was a highly complex affair, involving a synthesis of a very large number of different factors; furthermore, the new

* The reason of this abstraction is in practical nature, as already indicated. For all the savage *cares* about it, the death in general, *is* the real fact. It is all that interests him. It is hardly worth while to attempt to persuade the savage; indeed, if he were not only a savage, but also a philosopher, he might boldly challenge the objector to present *any* definition of object which should not refer objectivity to man's practical activity; although he might, as a shrewd savage, admit that some one activity (or self) to which the object is referred has more content than another. In this case, I, for one, should not care about entering the lists against the savage. But when the common-sense philosopher, who resists all attempts to reconstruct the original object on the ground that a fact is a fact and all beyond that is metaphysics, is also a case-hardened nominalist (as he generally is), it is time to protest. It might be true that the real object is always relative to the value of some action; but to erect this pure universal into the object, and then pride one's self on enlightenment in rejecting the "scholastic figment" of the reality of universals is a little too much.

cases of murder could be employed to reconstruct the original analysis-synthesis; to eliminate supposed factors which were not relevant, and to show the presence of factors at first not suspected. In other words, the real fact would be under constant process of definition, of "production." But the stiff-necked identification of the fragment, which happened to have practical importance with the real object, effectually prevents any such reaction and reconstruction. What is to be done, however, with these conditions of spear, of stone, of armor, which so obviously have something *to do* with the real fact, although, as it would seem, they are not the fact? They are considered as circumstances, *accidental*, so far as death in general is concerned; *necessary*, so far as *this* death is concerned. That is, wanting simply to get the net result of the removal of my enemy, so that he will no longer blight the fair face of nature, it is accidental how I do it; but having, after all, to kill a man of certain characteristics and surroundings in life, having to choose time and place, etc., it becomes necessary, *if* I am to succeed, that I kill him in a certain way, say, with poison, or a dynamite bomb. Thus we get our concrete, individual fact again.

Consider, then, that tortuous path from reality to reality, *via* a circuit of unreality, which calls the thought of necessity into existence. We first mutilate the actual fact by selecting some portion that appeals to our needs; we falsify, by erecting this fragment into the whole fact. Having the rest of the fact thus left on our hands for disposal, when we have no need of the concrete fact we consider it accidental, merely circumstantial; but we consider it necessary whenever we have occasion to descend from the outcome which we have abstracted back to the real fact, in all its individuality. Necessity is a device by which we both conceal from ourselves the unreal character of what we have called real, and also get rid of the practical evil consequences of hypostatising a fragment into an independent whole.

If the purely teleological character of necessity is not yet evident, I think the following considerations will serve to bring it out. The practical value, the fruit from the tree, we pick out and set up for the entire fact so far as our past action is concerned. But so far

as our *future* action is concerned, this value is a result *to be* reached; it is an end to be attained. Other factors, in reality all the time bound up in the one concrete fact or individual whole, have now to be brought in as means to get this end. Although after our desire has been met they have been eliminated as accidental, as irrelevant, yet when the experience is again desired their integral membership in the real fact has to be recognised. This is done under the guise of considering them as means which are necessary to bring about the end. Thus the idea of the circumstances as external to the "fact" is retained, while we get all the practical benefit of their being not external but elements of one and the same whole. Contingent and necessary are thus the correlative aspects of one and the same fact; conditions are accidental so far as we have abstracted a fragment and set it up as the whole; they are necessary the moment it is required to pass from this abstraction back to the concrete fact. Both are teleological in character—contingency referring to the separation of means from end, due to the fact that the end having been already reached the means have lost their value for us; necessity being the reference of means to an end *which has still to be got.* Necessary means *needed*; contingency means no longer required—because already enjoyed.

Note that the necessity of the means has reference to an end still to be attained, and in so far itself hypothetical or contingent, while the contingent circumstances are no longer needed precisely because they have resulted in a definite outcome (which, accordingly, is now a fact, and, in that sense, necessary) and we begin to see how completely necessity and chance are bound up with each other.

Their correlation may thus be stated: *If* we are to reach an end we *must* take certain means; while so far as we want an undefined end, an end in general, conditions which accompany it are mere accidents. Whichever way the relationship be stated, the underlying truth is that we are dealing with only partial phases of fact, which, having been unduly separated from each other through their erection into distinct wholes, have now to be brought back into their real unity.

In the first place, then, *if* I am to reach an end, certain means

must be used. Here the end is obviously postulated; save as it is begged (presupposed), the necessity of the means has no sense. If, when starving, I am to live I must steal a dinner, but, having stolen, the logical but unsympathetic judge may question the relevancy (that is, the necessity) of my end, and thus cut the ground out from under the necessity of my means. My end requires *its* justification, the establishing of its validity, before the necessity of the means is anything more than hypothetical. The proximate end must be referred to a more ultimate and inclusive end to get any solid ground. Here we have our choice: we may deny the existence of any organic whole in life and keep chasing in a never-ending series, the *progressus ad infinitum*, after an end valid in itself. In this case we never get beyond a hypothetical necessity—something is necessary *if* we are to have something else, the necessity being relative to the implied doubt. Or, being convinced that life is a whole and not a series merely, we may say there is one comprehensive end which gives its own validity to the lesser ends in so far as they constitute it. While, on the other alternative, we reach only a hypothetical necessity, on this we reach none at all. The comprehensive end is no end at all in the sense of something by itself to be reached by means external to it. Any such end would be simply one in the infinite series and would be itself hypothetical. Whenever minor ends cease to be in turn means to further ends it is because they have become parts, constituent elements, of the higher end and thus ceased to be steps towards an end and beyond and outside of themselves. Given a final (i. e., inclusive) end, eating and drinking, study and gossip, play and business, cease to be means *towards* an end and become its concrete definition, its analytic content. The minor activities state the supreme activity in its specific factors.

Our dilemma is the choice between an end which itself has no existence save upon presupposition of another end, (is contingent,) and an end which as an end in itself simply *is*.

The externality of means to end is merely a symptom of lack of specification or concreteness in the end itself. *If* I am going to invent some improvement in a type-writer, the necessity of going through certain preliminary steps is exactly proportionate to the in-

definiteness of my conception of what the improvement is to be; when the end is realised, the operations which enter into the realisation cease to be means necessary to an end and become the specific *content* of that end. The improvement is a *fact*, having such and such elements defining it. If I simply want, in general, to get my mail I *must* take this path (there being but one road); but if my end is not thus general, if it is individualised with concrete filling, the walk to the office may become a part of the end, a part of the actual fact. In so far, of course, it loses all aspect of necessitation. It simply *is*. And in general, so far as my end is vague, or abstract, so far as it is not specified as to its details, so far the filling up of its empty schema to give it particularity (and thus make it fact) appears as a means necessary to reach an end outside itself. The growth in concreteness of the end itself is transformed into ways of effecting an end already presupposed. Or, to state it in yet one other way, determination in the sense of definition in consciousness is hypostatised into determination in the sense of a physical making.

The point may come out more clearly if we consider it with the emphasis on chance instead of upon necessity. The usual statement that chance is relative to ignorance seems to me to convey the truth though not in the sense generally intended—viz., that if we knew more about the occurrence we should see it necessitated by its conditions. Chance is relative to ignorance in the sense rather that it refers to an indefiniteness in our conception of what we are doing. In our consciousness of our end (our acts) we are always making impossible abstractions; we break off certain phases of the act which are of chief interest to us, without any regard to whether the concrete conditions of action—that is, the deed in its whole definition—permits any such division. Then, when in our actual doing the circumstances to which we have not attended thrust themselves into consciousness—when, that is to say, the act appears in more of its own specific nature—we dispose of those events, foreign to our conscious purpose, as accidental; we did not want them or intend them—what more proof of their accidental character is needed? The falling of a stone upon a man's head as he walks under a window is "chance," for it has nothing to do with what the man proposed to

do, it is no part of his conception of that walk. To an enemy who takes that means of killing him, it is anything but an accident, being involved in *his* conscious purpose. It is "chance" when we throw a two and a six; for the concreteness of the act falls outside of the content of our intention. We intended *a* throw, some throw, and in so far the result is not accidental, but this special result, being irrelevant to our conception of what we were to do, in so far is contingent. The vagueness or lack of determinateness in our end, the irrelevancy of actual end to conscious intent, chance, are all names for the same thing. And if I am asked whether a gambler who has a hundred dollars upon the outcome does not *intend* to throw double sixes, I reply that he has no such intention—unless the dice are loaded. He may *hope* to make that throw, but he cannot intend it save as he can define that act—tell how to do it, tell, that is, just *what* the act is. Or, once more, if I intend to get my mail and there are four paths open to me it is chance which I take, just in proportion to the abstractness of my end. If I have not defined it beyond the mere "general result" of getting mail, anything else is extraneous and in so far contingent. If the end is individualised to the extent, say, of getting the mail in the shortest possible time, or with the maximum of pleasant surroundings, or with the maximum of healthy exercise, the indifferency of the "means," and with it their contingency, disappears. This or that path is no longer a mere means which *may* be taken to get a result foreign to its own value; the path is an intrinsic part of the end.

In so far as a man presents to himself an end in general, he sets up an abstraction so far lacking in detail as (taken *per se*) to exclude the possibility of realisation. In order to exist as concrete or individual (and of course, nothing can exist except as individual or concrete) it must be defined or particularised. But so far as consciousness is concerned the original vague end is *the* reality; it is all that the man cares about and hence constitutes his act. The further particularisation of the end, therefore, instead of appearing as what it really is, viz., the discovery of the actual reality, presents itself as something outside that end. This externality to the end previously realised in consciousness is, taken as mere externality, contingency,

or accident; taken as none the less so bound up with the desired end that it must be gone through before reaching that end, it is necessary. Chance, in other words, stands for the irrelevancy as the matter at first presents itself to consciousness; necessity is the required, but partial, negation of this irrelevancy. Let it be complete, instead of partial, and we have the one real activity defined throughout. With reference to this reality, conditions are neither accidental nor necessary, but simply constituting elements—they neither may be nor must be, but just are. What is irrelevant is now not simply indifferent; it is excluded, eliminated. What is relevant is no longer something required in order to get a result beyond itself; it is incorporated into the result, it is integral.

It now remains to connect the two parts of our discussion, the logical and the practical consideration of necessity, and show that, as suggested, logical necessity rests upon teleological—that, indeed, it is the teleological read backwards. The logical process of discovering and stating the reality of some event simply reverses the process which the mind goes through in setting up and realising an end. Instead of the killing of an enemy as something to be accomplished, we have the fact of a murder to be accounted for. Just as on the practical side, the end, as it first arises in consciousness, is an end in general and thus contrasts with the concrete end which is individualised; so the fact, as at first realised in consciousness, is a *bare* fact, and thus contrasts with the actual event with its complete particularisation. The actual fact, the murder as it really took place, is one thing; the fact as it stands in consciousness, the phases of the actual event which are picked out and put together, is another thing. The fact of knowledge, it is safe to say, is no *fact* at all; that is, if there had been in reality no more particularisation, no more of detail, than there is consciousness, the murder would never have happened. But just as, practically, we take the end in general to be the real thing, (since it is the only thing of any direct interest,) so in knowledge we take the bare fact as abstracted from the actual whole, as *the* fact. Just as the end of the savage is merely to kill his enemy, so the "fact" is merely the dead body with the weapon sticking in it. The fact, as it stands in con-

sciousness, is indeterminate and partial, but, since it is in consciousness by itself, it is taken as a whole and as the certain thing. But as the abstractness of the "end in general" is confessed in the fact that means are required in order to make it real—to give it existence—so the unreal character of the "fact" is revealed in the statement that the causes which produced it are unknown and have to be discovered. The bare fact thus becomes a result to be accounted for: in this conception the two sides are combined; the "fact" is at once given a certain reality of its own while at the same time the lack of concreteness is recognised in the reference to external causes.

The gradual introduction of further factors, under the guise of causes accounting for the effect, defines the original vague "fact," until, at last, when it is accounted for, we have before us the one and only concrete reality. This done, we no longer have an effect to be accounted for, and causes which produce it, but one fact whose statement or description is such and such. But intermediate between the isolation and the integration is the stage when necessity appears. We have advanced, we will suppose, from the bare fact of the murder to the discovery of a large amount of "circumstantial" evidence regarding that fact. We hear of a man who had a quarrel with the deceased; he cannot account for himself at the time when the murder *must* have been committed; he is found to have had a weapon like that with which the murder *must* have been committed. Finally we conclude he *must* have been the murderer. What do these "musts" (the "must" of the time, weapon, and murderer) mean? Are they not obviously the gradual filling-in of the previously empty judgment, through bringing things at first unconnected into relation with each other? The existence of the man M. N. is wholly isolated from the "fact" of the murder till it is learned that he had a grudge against the murdered man; this third fact, also distinct *per se*, brought into connection with the others (the "fact" of the murder and of the existence of M. N.) compels them to move together; the result is at first the possibility, later, as the points of connection get more and more marked and numerous, the "necessity," that M. N. is the murderer. Further, it is clear that this "must" marks not a greater certainty or actuality

than a mere "is" would indicate, but rather a doubt, a surmise or guess gradually gaining in certainty. When the fact is really made out to our satisfaction, we drop the "must" and fall back on the simple *is*. Only so long as there is room for doubt, and thus for argument do we state that the time and weapon must have been such and such. So when we finally conclude that the murderer must have been M. N., it means that we have woven a large number of facts, previously discrete, into such a state of inter-relationship that we do not see how to avoid denying their discreteness and incorporating them all into one concrete whole, or individual fact. That we still say "must" shows, however, that we have not quite succeeded in overcoming the partial and indefinite character of the original "fact." Had we succeeded in getting the whole fact before us the judgment would take this form: The murder *is* a fact of such and such definite nature, having as its content such and such precise elements. In this comprehensive whole all distinction of effect to be accounted for and causes which produce clean disappears. The idea of necessity, in a word, comes in only while we are still engaged in correcting our original error, but have not surrendered it root and branch; this error being that the fragment of reality which we grasp is concrete enough to warrant the appellation "fact."

A great deal of attention has been directed to the category of cause and effect. One striking feature of the ordinary consideration is, that it takes for granted the matter most needing investigation and aims the inquiry at the dependent member of the firm. The effect seems to be so clearly *there*, while the cause is so obviously something to be searched for that the category of effect is assumed, and it is supposed that only the idea of causation is in need of examination. And yet this abstraction of certain phases of fact, the erection of the parts thus abstracted into distinct entities, which, though distinct, are still dependent in their mode of existence, is precisely the point needing examination. It is but another instance of the supreme importance of our practical interests. The effect is the end, the practical outcome, which interests us; the search for causes is but the search for the means which would pro-

duce the result. We call it "means and end" when we set up a result to be reached in the future and set ourselves upon finding the causes which put the desired end in our hands; we call it "cause and effect" when the "result" is given, and the search for means is a regressive one. In either case the separation of one side from the other, of cause from effect, of means from end, has the same origin: a partial and vague idea of the whole fact, together with the habit of taking this part (because of its superior practical importance) for a whole, for a fact.

I hope now to have made good my original thesis: that the idea of necessity marks a certain stage in the development of judgment; that it refers to a residuum, in our judgments and thus in our objects, of indeterminateness or vagueness, which it replaces without wholly negating; that it is thus relative to "chance" or contingency; that its value consists wholly in the impulse given judgment towards the *is*, or the concrete reality defined throughout. The analysis has been long; the reader may have found it not only tedious, but seemingly superfluous, since, as he may be saying to himself, no one nowadays regards necessity as anything but a name for fixed uniformities in nature, and of this view of the case nothing has been said. I hope, however, that when we come to a consideration of necessity as equivalent to uniformity, it will be found that the course of this discussion has not been irrelevant, but the sure basis for going further.

JOHN DEWEY.

THE ISSUES OF "SYNECHISM."

IN a late number of *The Monist*, (Vol. II, No. 4,) there appears a singularly acute and profound article, from the pen of one of the ablest of American logicians and mathematicians, Mr. Charles S. Peirce. Its subject is "The Law of Mind"—the idea of continuity. The writer tells us, (p. 534,) "the tendency to regard continuity, in the sense in which I shall define it, as an idea of prime importance in philosophy, may conveniently be termed *Synechism.*" With this *synechistic* philosophy, as applied to mind, the paper is occupied, to the exclusion, for the nonce, of Mr. Peirce's companion doctrine of *Tychism*,* which was dealt with, by him, in the January, 1891, and April, 1892, issues of *The Monist*. These conceptions are, both of them, to be viewed as essential to philosophy as a whole, but the latter is, for the present, allowed to drop out of sight, in order to allow of the due elaboration of the former.†

THE FORMULA OF SYNECHISM.

The formula of Synechism, with which the article begins, is as follows:

> "Logical analysis applied to mental phenomena shows that there is but one law of mind, namely, that ideas tend to spread continuously, and to affect certain others which stand to them in a peculiar relation of affectibility. In this spreading they lose intensity, and especially the power of affecting others, but gain generality, and become welded with other ideas." (Vol. II, No. 4, p. 534.)

The individuality and continuity of ideas are, then, shown respectively to involve no contradiction; an idea once past—in the

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* From τύχη, chance.

† *Tychism* again comes to the front in the succeeding number of *The Monist*, (Vol. III, No. 1,) in an article by Mr. Peirce, entitled "Man's Glassy Essence."

sense of an event in an individual consciousness—is not wholly past, it is only going—"infinitesimally past, less past than any assignable past date." Thus the conclusion is reached that "the present is connected with the past by a series of real, infinitesimal steps." Again, "We are forced to say that we are immediately conscious through an infinitesimal interval of time. This is all that is requisite." (*Ibid.*, pp. 535–536.)

All that it is necessary to say at the outset is, that this view is supported by an elaborate inquiry into the nature of infinity and continuity in general, into which, for the purpose of the present paper, it is not needful to enter. And this for two reasons: (1) The synechistic philosophy, by itself, does not profess to be monistic. Its expounder does not, even if his Tychism were not in reserve, profess to carry it beyond the realm of mind, with all that is implied in such a reservation. Now, it is the bearing of Mr. Peirce's Synechism upon a monistic solution of the universe with which the present article is concerned. And (2) Mr. Peirce's method of treatment, though precise and logical in the direction of its own path, is too purely technical to be summarised for the general reader's benefit. But withal, Synechism is far too fertile, not so much in respect of what it makes clear, as suggestively, and, if the expression may be allowed, *obliquely*, to be passed over without comment. Its excogitator is eminently frank; he does not conceal the difficulties which, ever and anon, occur in his statement. Sometimes his theory seems a trifle too wide for the facts encountered, sometimes rather too scanty to contain them. Such phrases as the following: "No, I think we can only hold"—p. 552; "we are driven to perceive"—p. 555; "this obliges me to say"—p. 557; "the principle with which I set out requires me to maintain"—p. 558; "the only answer that I can, at present, make is"—p. 559, etc., etc., do every credit to the writer's candor, but they would scarcely occur in an exposition, which, in the mind of its author, made the rough places altogether plain. Synechism, even with Tychism in the background, probably does not, in Mr. Peirce's own mind, completely solve the world-riddle, at least, as yet. Still these very pauses themselves, on the part of a thinker of such ability, are eminently suggestive.

To use his own words: "the present paper is intended to show wha Synechism is, and what it leads to." Let us emphasise this latter clause, as likely to be more fruitful than the former.

MR. PEIRCE'S POSITIVISM.

Mr. Peirce, in spite of his theory of chance, is, in his Synechism, almost severely a positivist;* but his positivism, like most of that current nowadays, does not go deep enough. He is positivist, *after* he has got externality—fertile in excitations—comfortably disposed around his subject; and vibrations, undulations, attractions, etc., ready to play upon the thousand-stringed harp, *but not before.* For, "we must not tax introspection," he tells us, p. 548, "to make a phenomenon manifest, which essentially involves externality," when the real problem at issue is: Is there externality, in the vulgar sense, at all, or is it only that *rationalised externality* which *circumspection,* within the limits of egoity, reveals? Now, upon this a good deal hinges. At all events the difference in question, or, rather, that there *is* a difference, has been mooted, to say the least. And, this being the case, it is a little tedious, when the really vital point of the spatial extension of feelings is being debated, to have this illustration brought in, (p. 548,): "Moreover, our own feelings are focused in attention to such a degree, that we are not aware that ideas are not brought to an absolute unity. Just as nobody, not instructed by special experiment, has any idea how very, very little of the field of vision is distinct." Why, that is reasoning in a circle, if some systems are true; and it is a begging of the question, if they are the reverse.

If the system of so-called objective reality were, at sight, wholly veracious, if everything existed just as it seems, this positivism of Mr. Peirce's might be workable. Then no one would seek to go beneath the process of the apparent, the actually visible, for a *rationale.* But modern science teaches, in its very primer, that many things are, and act, quite otherwise than as they seem to be, and do. Appearances *rationalised* are alone to be accepted. The sun

* Dr. Carus, in his review of Mr. Peirce's doctrines, (*The Monist,* Vol. II, No. 4, p. 575,) notes this positivistic-constructionism.

does not "rise" and "set," as it seems to do. The earth is not, as it appears to be, an immovable plane, and so on. And, this once allowed, where is the principle to end? If the superficial judgment may be thus corrected, or reversed, it is liable to revision or reversal *ad infinitum*, unless reason be shown to the contrary. It may thus be disputed whether our author is quite in order in writing, as he does, and using the statement to support his theory—"Precisely how primary sensations, as colors and tones, are excited, we cannot tell, in the present state of psychology. . . . As far as sight and hearing are in question, we know that they are only excited by vibrations of inconceivable complexity; and the chemical senses are probably not more simple." (P. 557.)

To argue, we cannot tell precisely *how* they are excited, but we know that they *are* excited, is somewhat feminine; seeing that the said "excitement" is not patent on the surface of ordinary perception. And, this being the case, the excitement, or its mode rather, not being given immediately, but only mentally annexed, Mr. Peirce is not consistently positivist. It is equally open to an opponent to "annex" something else of his own to the "given" thing, or altogether to deny the necessity of anything whatever being thus annexed. In any case that (if anything) which is sought to be annexed must stand the test of positivism; we must know *if* such a thing is, and *what* it is precisely. And this is just what Mr. Peirce cannot do for us. He cannot tell us exactly what the "excitant" of feelings *is;* he can only guess what it is "*something like,*" viz.: the feelings themselves. Hence the following:

"The principle with which I set out [that of continuity] requires me to maintain that these feelings are communicated to the nerves by continuity, *so that there must be something like them in the excitants themselves*. If this seems extravagant, it is to be remembered that it is the sole possible way of reaching any explanation of sensation, which otherwise must be pronounced a general fact absolutely inexplicable and ultimate. Now absolute inexplicability is a hypothesis which sound logic refuses, under any circumstances, to justify." (P. 558.—The italics are not in the original.)

There must be something like the feelings in the excitants of the feelings. Now, this point is worthy of the closest attention. Note that "the excitant" *alone* is mentioned. *Vibrations* excite sight

and hearing. Yet, from what follows, it is plain that Synechism is not inconsistent with belief in a fixed objective. "Even the least psychical of peripheral sensations, that of pressure, has, in its excitation, conditions which, though apparently simple, are seen to be complicated enough when we consider *the molecules and their attractions*," pp. 557-558. Can there, then, be any doubt that we have here three distinct things: (1) a subjective, (2) an "excitant," and (3) an objective; the middle term being a vehicle of communication between the first and third? It does not affect this presentation of Mr. Peirce's position that, at an earlier stage of his argument, he speaks of matter—synonymous, presumably, with the objective—as being "not completely dead, but merely mind, hide-bound with habits," as "partially deadened" or "effete," mind; or that the editor of *The Monist* says that, with Mr. Peirce, "mind is the beginning of all." (*The Monist*, Vol. III, No. 1, p. 95.) The question, at present, is not regarding origins, but regarding co-existences. So that there is a distinct *hiatus* here, arising from the confusion of the stimulant, or excitant, of sensation with the objective itself.* Now, the stimulant of sensation is never the object perceived. Hence, once an objective is admitted, a trinity of entities is unavoidable, since still less can the "stimulant" be the subject. This special difficulty, in the present writer's opinion, is inseparable from dualism in every form. How it besets Mr. Peirce's theory is evident from his hazarded suggestion: "There must be *something like* the feelings in the excitants." He thus uses only two of his cosmical terms, and gives the third the go-by! All dualism halts, but surely there is here a palpable stumble.

In a recent article in *The Open Court*† I have pointed out the vanity of introducing a vehicle of communication between object and subject, especially emphasising the fact that, once this intermediate term is brought in, the veritable objective disappears. "Once you bring in vibrations," I remarked, "you practically provide a *second* object, which is really a part of the subject, and, in

* Cf. T. H. Green, *Prolegomena to Ethics*, Ch. II, p. 63.

† Nos. 258, 59, 61, August, 1892. *Miss Naden's World-Scheme.*

order to do this, you have taken from the original objective all that composed it."* (*The Open Court*, p. 3361.)

Is it any wonder, then, that Mr. Peirce should suppose the excitants to be "something like" the excited feelings? Since he, practically, surrenders the objective, what could more closely resemble the subjective than the subjective itself? If he had adopted the position of Hume, and made impressions and ideas all-in-all, his principle of continuity might hold. But this he does not do, since (1) he implicity admits the objective element, and (2) even if he did not do this, there must be something other than the idea or feeling in his system, since, otherwise, there could be no ground for the charge of seeming "extravagance," which, he admits, may be leveled against, at least one of, his conclusions.

FEELINGS SPATIALLY EXTENDED.

This leads us to Mr. Peirce's conclusions regarding subjective spatial extension—the spatial extension of feelings—as the result of observation of irritated protoplasm. Our attention is directed to an excited mass of protoplasm,—an amœba, or a slime-mould,—which "does not differ in any radical way from the contents of a nerve-cell, though its functions may be less specialised." (P. 547.) The irritation is induced when, say, the amœba is "quiescent and rigid," and we note its behaviour under it. That feeling passes from one part of this amorphous continuum of protoplasm to another, we are led to believe. And this conclusion follows: "Whatever there is in the whole phenomenon to make us think there is feeling in such a mass of protoplasm,—*feeling*, but plainly no *personality*,—goes logically to show that that feeling has a subjective, or substantial,

* In a note to this passage was appended a quotation from a pamphlet by Dr. E. Cobham Brewer as a practical instance of the objective being, on the antiquated subject-object plane, actually superseded. Suppose a very remote star to become extinct, the "vibrations" would continue to "travel" towards a spectator situated on our planet for years, it may be for centuries. So that the spectator, ultimately, "sees" that which does not even exist. Dr. Brewer's comment, which cannot be considered any contribution to a satisfactory *rationale*, is: "the objects, however, must have existed, or no messenger could have been sent from their courts." Evidently, in this case, that which is sent is, at least, as good as the sender—is, in fact, the self-same thing. Only, in that case, what of the extinct object?

spatial extension, as the excited state has." This is a chain of reasoning. Let us examine its links. We have:

(1) The behaviour of the amœba under immediate, mechanical irritation—the spread, or spatial extension, of the state of irritation.

(2) We are asked to identify this spread-out irritation, this field of excitation, with "feeling" on the part of the amœba, because there is "no doubt that it feels when it is excited."

(3) From the spatial extension of the irritation, thus identified with feeling, we are asked to conclude that the feeling, in the amœba, has a subjective, spatial extension as the excited state has, and, finally, passing from the feeling of the amœba to our own feelings, by inference, we are asked to admit:

(4) Not that we have necessarily a feeling of bigness, but that "the feeling [inferentially arrived at from the spread-out irritation on the part of the amœba] as a subject of inhesion is big." (P. 548.)

After this, we are disposed to agree with Mr. Peirce when he says: "This is, no doubt, a difficult idea to seize"; not, as he goes on to say, "for the reason that it is a subjective, not an objective, extension," but on the ground that the reasoning involves, plainly, not only the subjective and objective, but what Clifford calls the "ejective," as well, and this assumption, *inter alia*, that the last-named lies on the same plane as the former. Never, surely, was the conclusion that feelings have spatial extension more easily reached. It is only when we find that in (1) we are dealing with the objective pure and simple, observed phenomena; that in (2) the connection between irritation or excitation, and feeling is assumed, in the object, because feeling, subjectively, is found to accompany irritation; that (3) as the irritation, in the amœba, is spread out, so is the feeling to be viewed; and (4) that, as the feeling of the amœba, so is our feeling to be considered, viz.: that the feeling, "as a subject of inhesion, is big," we are led to say after all this, that, by such a process, anything, or everything, could be demonstrated, —the *field* of spatial extension, for example, having no more claim to be assumed than the *point* at which the irritation admittedly begins. Why should the *middle* stage of the irritation be selected in preference to the *initial* and *final* ones? The irritation originates in a

point, spreads, and then dies out. Thus our feeling, (we purposely use Mr. Peirce's nomenclature,) or idea, of an elephant, is unquestionably, as a subject of inhesion, "big." *But only for a time, and not at first.* Really, our idea, or feeling—in Synechism—of an elephant, must logically commence as a minute speck, and return to this vanishing-point again. There is no other way out of it. For must not the analogy of the irritated amœba be followed throughout, and if not, why not?

DUALISM AND THE WAY OUT.

The *crux* of philosophy, from the time of Hume to the present day, has been, what may be summarised as, the consciousness of succession *as* succession. The hours pass over the mental dial, but, though one succeeds the other, something is needed besides the succession of the terms of the series to give consciousness of the series *as a series*, to give the synthesis of the day made up of hours. Hume virtually gave up the problem in eviscerating the subjective. Prof. T. H. Green only missed the point at issue when he placed his eternal consciousness, which was to "have and to hold" the terms of the cosmical series, as it were in solution, for the human organism, *out of time altogether.* Mr. Peirce puts the matter boldly when he says: "An idea once past is gone forever, [in the sense of an event in an individual consciousness,] and any supposed recurrence of it is another idea." (P. 534.) In order, then, that an idea past may be present really, and not vicariously, the notion that consciousness necessarily occupies an interval of (finite) time must be given up; since, to put it briefly, a second past is as much past as a year. According to Mr. Peirce then, and his contention is supported by an elaborate inquiry into the nature of infinity and continuity generally, "we are immediately conscious through an infinitesimal interval of time." For the complete *rationale*, reference must necessarily be made to the article itself.

Even the above outline, however, is sufficient to show that, here as elsewhere, Mr. Peirce's dualism is his snare. Nothing but this could lead to a disintegration so complete as the following:

"In this infinitesimal interval, not only is consciousness continuous in a subjective sense, that is, considered as a subject, or substance, having the attribute of

duration; but also, because it is immediate consciousness, its object is *ipso facto* continuous." (P. 536.)

This is to admit, practically, that there is something in consciousness other than the consciousness itself. And this is evident, because at one and the same time, (whether an interval of finite time, or an infinitesimal interval,—whether an "instant" or a "moment,"—does not matter,) these two entities are different. For:

"This mediate perception is objectively, or as to the object represented, spread over the four instants; but subjectively, or as itself the subject of duration, it is completely embraced in the second moment." (*Ibid.*)

But this "mediate" and "immediate" cannot simultaneously exist, unless there is something else *to which* they do so exist. It is only paltering with us in a double sense to speak of "instant" and "moment" in this connection. The one may pass into the other, but there is "a time when" (it matters not whether the interval be finite or infinitesimal) they do not coexist. Hence, they are not the same, but different.

According to Mr. Peirce's notation, for all ordinary purposes we may write, if a is a finite quantity, and i an infinitesimal, $a+i=a$. "That is to say, this is so for all purposes of measurement." Be it so; the infinitesimal may be neglected for purposes of calculation. But such a formula can only be experimental. The theory which embodies it cannot avail for a world-scheme; to admit it would be to grant that a thing is, and is not, at one and the same time. Surely the most superficial reader will see that, to put it popularly, a world-scheme admits of no alternative subject to accept, or to reject, a neglectable quantity.

And this is not the only instance of dualism in Mr. Peirce's world-scheme as a totality. For have we not Synechism and Tychism as well? With the latter Mr. Peirce does not deal in the paper now under consideration. He must, however, be credited, or debited, with it, as held in reserve. For our present purpose it is not necessary to examine Tychism in detail. Its alleged existence is sufficient. For, and here let the significance of what follows be noted, in Mr. Peirce's view, as opposed to determinism, Tychism exists as a principle. It *is*, otherwise it could not be expounded as operative. But

it also exists as an idea, first, it may be, in our author's mind, and subsequently in the minds of his disciples. Thus it falls into the synechistic province: "As an idea it can only be affected by an idea, by anything but an idea it cannot be affected at all." ("The Law of Mind," p. 557.) Yet to affirm Tychism thus impotent, because unaffectible, outside the synechistic sphere, is to contradict Mr. Peirce's conclusions, for if Tychism is nothing outside the ideal realm, it is altogether inside it. Hence Synechism is everything practically, and Tychism nothing. But that Mr. Peirce will not have. He has a two-fold Tychism, that is the fact; actual and operative on the one hand, ideal on the other. And this is dualism confessed.

Mr. Peirce's method is quite fertile in duplication of the subjective entity. His latest paper, "Man's Glassy Essence," (*The Monist*, Vol. III, No. 1,) contains some typical instances.

> "Viewing a thing from the outside, considering its relations of action and reaction with other things, it appears as matter. Viewing it from the inside, looking at its immediate character as feeling, it appears as consciousness." (P. 20.)

This is the strictly empirical view. And it may be possibly defended with the contention that all problems, to be duly examined, must, in the first place, be viewed from that standpoint. But it must be plainly manifest to any unprejudiced thinker that, even granted a total cosmical problem made up of separate problems of an individual nature, the same method of solving the sum cannot be employed which is used in solving its constituents. In the above instance, considering matter in its totality, and consciousness in its totality, what is left to view them indifferently from "outside," or "inside"? Plainly nothing. Still more transparent an example is the following:

> "The consciousness of a habit involves a general idea. In each action of that habit certain atoms get thrown out of their orbit, and replaced by others. Upon all the different occasions it is different atoms that are thrown off, but they are analogous from a physical point of view, and there is an inward sense of their being analogous. Every time one of the associated feelings recurs, there is a more or less vague sense that there are others, that it has a general character, and of about what this general character is." (P. 20.)

This is part of the answer to the query: How do general ideas appear in the molecular theory of protoplasm? Now, without discussing the value of this *rationale*, as affecting Mr. Peirce's own theories, it is not difficult to see what its acceptance would "lead to." Certain atoms of a molecule get thrown out and are replaced by *others*. This happens repeatedly. On different occasions *different atoms* come and go. Yet they are "analogous," and there is "an inward sense" of this. Upon whose shoulders is the burden of proving the analogy placed, or of experiencing it even? With whom or what is there "an inward sense"? Perhaps it is better not to answer otherwise than to say that if this faculty be not present in the ever changing molecule to begin with, it cannot be logically reached by any process of multiplying it.

THE MONISTIC SOLUTION.

Monism, as a unitary system of the universe, does not necessarily commend itself to acceptance simply *as* monism. To say, this is dualism, *therefore* it cannot be a correct *rationale* of the universe, since the only true one must be monistic, is to start with an unphilosophical prepossession. The true solution may be twofold, or it may be manifold. But it is not too much to say, perhaps, on the other hand, that, even as causes may not be multiplied without necessity, even so phenomena must not logically be divided into independent groupings without sufficient reason given. Preference should be accorded to a monistic, rather than to a dualistic, system, not on the ground alone of the simplicity of the former, but on the ground that a theory which has one explanation for one set of phenomena and another explanation for a second set, must first demonstrate that a unitary conception of the universe is, at least, improbable, otherwise it will always be hinted that the dualism in question has not gone deep enough to find a synthetic bond wherewith to unite the apparently diverse. Mr. Peirce, throughout his article on Synechism, constantly touches, despite his latent dualism, the margin of a truth so great as to merit the title of transcendent. As often he misses it. And his concluding words are, in this connection, almost wistful: "The facts that stand before our face and

eyes and stare us in the face, are far from being, in all cases, the ones most easily discerned. That has been remarked from time immemorial." (P. 559.) But though thus "remarked," the maxim has, as immemorially, been neglected in practice. To none can this remark be more fitly applied than to the excogitator of Synechism, himself seeing that, having arrived at the point of asserting that "there must be *something like* the feelings in the excitants themselves," he does not see that the excitant and the feeling are one and the same; and that there is no second or third term in the cosmical equation.

Does this seem "extravagant"? If so, the reply must be *not* that it is the only escape from an otherwise inexplicable difficulty, but that there is really no difficulty at all. What Mr. Peirce's own Synechism *"leads to"* is that the past, the present, and the to-come, alike of matter and idea, are not reconciled by "time and its flow," or even by the logic of infinitesimals, subtle though that may be, but that the contents of each and all, with all their apparently infinite variety, resolve into a consistent unity.

THE "MISSING LINK."

Pushed to a logical conclusion, the excitants and the feelings owe their apparent variety to their assigned position in a series, the correspondence or relation between them being *only another link in the self-same chain.* Vulgar realism never fathoms this explanation. It always harps upon the one string that idealism, and more especially idealistic monism, fails to account for variety or difference; forgetting, or rather never seeing, that difference or variety which is its essence, is only one more added perception on the same plane with ordinary perceptions; so that given *a*, *b*, *c*, *d*,—sundry perceptions,—their essential variety may be stated as *e*. Or this may be stated numerically; variety, as a whole, being nothing more than the sum of differences, which is always something other than the terms differentiated, but always on the same level with them—the difference between any continuous number, above unity, and another number being a third number, which is different from either. Variety in numbers cannot be expressed otherwise than numerically.

So, in the last recess, the variety of colors is only colorable, of tones audible, and so on. The "vibrations of inconceivable complexity" which, according to Mr. Peirce, "excite sight and hearing," can be approximately stated numerically, so that the difference between red and, say, yellow, is a number corresponding to another color, which may be orange or not; it being part of the present scientific theory of light that any specific number of ethereal undulations happening between the colors of the ocular spectrum, corresponds to a possible color, although the retinal expanse may be insensible to these particular rates of tremor. To Mr. Peirce it may appear "extravagant," but the difference between any two colors and tones is another color, another tone; just as the difference between any two numbers is a third number. This is the logical outcome of his own Synechism; *this*, in part, is what it "leads to."

TIME AND ITS "FLOW" RATIONALISED.

Excitants and feelings being unified, and the element of variety, hitherto supposed to be the exclusive copyright of vulgar realism, shown to be nothing but another term added to the series, or, numerically, a concurrent series—so that should a, b, c, d . . . be a series, the variety of the series may be expressed as e, or the individual differences as f, g, h. . .—it only needs an examination of what Mr. Peirce terms "time and its flow," to render his system a completely monistic one, and this although true monism is much more than the negation of determinism, synechistically expressed.

In Mr. Peirce's article under examination, "The Law of Mind," the notation of infinitesimals, which forms the keystone of Synechism, is only introduced after a lament over the incapacity, or unworkableness rather, of finite time, when the duration of consciousness is involved. If *finite* time is to come in as a factor—"an idea once past [in the sense of an event in an individual consciousness] is gone forever, and any supposed recurrence of it is another idea" (p. 534). And the problem which Mr. Peirce sets himself to solve is how in effect to bring *back* this past idea—not vicariously—but in all its pristine freshness, into the now-time. This is sought to be accomplished by the explanation that the past idea is "not wholly

past, it is only going, less past than any assignable past date"—and so on through the intricacies of Mr. Peirce's infinitesimal theory, into which we need not enter at present. But the statement of the, supposed, difficulty which finite time presents in this connection,—the past idea really past and gone, and the recurrence of it another idea,—if put in a slightly different form, hints a solution, in continuity with the foregoing pages, without the aid of the infinitesimal at all. *That an idea is once past and gone*, any occurrence, or recurrence, of this idea, *is another idea.**

But, in the meantime, let us see what Mr. Peirce has to say regarding "time and its flow":

> "One of the most marked features about the law of mind is, that it makes time to have a definite direction of flow from past to future. The relation of past to future is, in reference to the law of mind, different from the relation of future to past. This makes one of the great contrasts between the law of mind and the law of physical force, where there is no mere distinction between the two opposite directions in time than between moving northward, and moving southward" (p. 546).

This for once is not very clear. It is difficult to see how "the law of physical force" can be spoken of as "in time," to the exclusion of mind; not easy, also, to understand the distinction further insisted upon. But the intention is evident, viz., to perpetuate, if not to originate, a cosmical duality. Time, it would seem, marches indifferently in at least two directions, though it is not very clear how this is accomplished. And then the old fiction follows, that "Time, as the universal form of change, cannot exist unless there is something to undergo change, etc." (p. 547.)

The same notation suits in this case as in the foregoing. Time is only another term in the series. If *a*, *b*, *c*, *d* be a series, *e* is the variety, *f* the whole time involved, and *g* the individual intervals. Of course all this is not a simple series, it is an infinitely complicated one; the above arrangement is only intended to show that difference, variety, time, etc., are no mysterious entities pervading events, acting as their "form" or carrying them in their "flow," but simply percepts, or concepts, on a level with others.

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* Or to put it in another form, any one idea, and the timing of this idea are really two ideas, although, as we shall see later, they may be inseparable in practice.

This is not patent on the surface, it may be. Time has the appearance of a current in which events float. But this is an illusion dispelled by examination. Events cannot be submerged in time. Time cannot be the vehicle of events. It is impossible to conceive time as existing simultaneously with an event. It always follows it. What to Mr. Peirce appears as a "flow," arises from the foregoing. Take events, percepts, or concepts, as a hypothetical series, *a*, *b*, *c*, *d* . . . . . and their times as *a'*, *b'*, *c'*, *d'*. . . . the first series contains the event *per se*, or as happening; the "time when" is contained in the second series, practically inseparable from the first, but the time when necessarily follows—consequently if the first be *a*, the second must be, at least *a'*. But no concept or percept is abstract, except the concept time itself, which, being unconnected, *seems* anywhere, and, like its fellow-abstract space, is spread out, to us, tri-dimensionally, as past, present, and to come. And, as in space the position is simply spectral,* a question of perspective or adjustment, so, in time, the timal series is adjusted to the substantive idea. But this twofold spectral succession breeds by comparative intensity (which is another complex series) the sense of a flow, where there is none, but only the idea of a flowing, which is another matter. Thus, the so-called "veil of the future" is no more a veil than it is a brick-bat. It is simply the indeterminateness of an unconnected adjective —as if one should say, white—and the query arises, *What* is it that is white? When the noun is supplied you have something definite. Just so, when the future lapses into the present.

Thus there is never anything without, at least, these three additions: first, variety or difference; second, time; third, relation, spatial or otherwise. These are all terms in a series, or set of concurrent series. Nothing can be, practically, isolated, for everything runs in a series. But this is a much broader theory of continuity than that which Synechism affords.† All apparent perplexities vanish. The difficulty no longer exists that to perceive a series we must hold it, as it were, in solution. Since other than series nothing is.

* Cf., in this connection, the results of experiments by Cheselden, as far back as 1727 on congenitally blind persons, couched for double cataract.

† Much more inclusive, also, than the Relational Theory of the Neo-Kantians.

Hence the cosmos is an illimitable series or complex of series. But inasmuch as the timal element (as also the spatial) occurs through the series having time-term and space-term resident within it, all difficulty in apprehending it as a series vanishes. The impracticability, if any, would be in viewing any term as isolated.

THE RESULT *RE* TYCHISM.

What a flood of light does such a system shed indirectly upon Tychism, since the controversy between the latter and determinism mainly hinges upon the "must be," the imperative, as it were, of the series! It has been very ably pointed out by Dr. Carus in his article *re* Mr. Peirce's "Onslaught on the Doctrine of Necessity" (*The Monist*, Vol. II, No. 4, pp. 573–4) that the formula adopted by Mr. Peirce in his Tychism, "chance is first, law is second, the tendency of habits is third," involves its author in the admission of a law in a system professing to be, in its inception at all events, chanceful and *lawless*. Mr. Peirce's "Synechism" professes to be the law of mind. Parenthetically, however, it may be remarked, that the distinction as to law, and lawlessness or "chance," narrows itself to the plane of one term more or less in a series, or *even to less than that subordinate place*. For, although, for convenience sake, and for facility of contrast, we have followed Mr. Peirce's figure of a series, to show more clearly also to what his theory leads, it is nevertheless plain, that time and its accompanying relations being placed on their proper level, that of integral percepts and concepts, the figure of a series is simply a matter of convenience of arrangement. Certainly as the "time when" is necessarily annexed to every percept and concept the timal element may be said to follow, not to precede, its fellow-term. Really, however, they may be said to be simultaneous, since the timal refinements of finite, infinite, past, present, and future are each of them contained in a percept of its own.

EXTERNALITY A SERIAL TERM.

But if the timal element be independent as a separate percept, the spatial as another, and so on, it follows that, although the terms of the series may, as it were, *run*, though we cannot conceive them

separated, or as, in practice, otherwise than as continuous in their flow, still, theoretically, a series or complex of series it *is*, and a series may be interrupted at any term. Thus externality itself being a spatial relation, is but *one term more*, non-essential in theory, to the term preceding. So that when the Neo-Kantians speak of the "constitution of the objective" it ought to be added that it is not only the content of the objective which is thus constituted by consciousness, but that externality, all that goes to make up what is termed "out-sidedness," is constituted by consciousness also.

THE NOW-TIME.

"*The present is half past, and half to come,*" (p. 546) like the color of a curved boundary line on a particolored surface; i. e. "betwixt and between" the two. It is here that the theory of Synechism shows its chief defect. Up to this stage we have been dealing with ideas, feelings, *a*, *b*, *c*, *d* . . . successively passing through a point of consciousness *e*. And the infinitesimal notation suits the required process fairly well. It is complicated enough, but it is ingenious, and at least plausible. Nothing up to this stage would lead us to suppose that any additional element was to be imported into the *rationale* which Mr. Peirce presents. As we have seen, finite time would not serve his purpose. By however minute a *finite* interval have *a*, *b*, *c* or *d* passed the point *e*, all chance of their recovery is hopeless. Well, we have recourse to infinitesimals, and find (to put it popularly, and not in Mr. Peirce's technical terms) that *a* past the point of consciousness by an infinitesimal interval heralds *b*. So that *e* is simultaneously confronted with the disappearing form of the first and the appearing form of the second, and the same with *b*, and *c*, in turn, and so on. Thus the present, in the sense of ideas successively passing through consciousness, is half *a* and half *b*, then half *b* and half *c*, this infinitesimal gradation ultimately ensuring the presence of the whole series in the last "moment."

But this will not avail with the concept time itself as distinguished from timed succession. That these two are separate with Mr. Peirce it is impossible to doubt. He says, e. g., "Time with its continuity logically involves some other kind of continuity than

its own," (p. 547) and speaks of "time and its flow," and of "time as the universal form "of change." And it is confusing, to say the least, when we are shifted without warning from what is practically the perceptual to the conceptual region. Granted the ideas, the feelings, or what not, "gliding almost imperceptibly" (as did the late Mr. Bardell to another sphere) past the central point of consciousness, yet not wholly past, only going, less past than any assignable past date, granted this, the assertion is not consequently warranted that time itself, the *present*, as time, not as involving the succession of ideas, is "half past and half to come." The ideas, the feelings, of which Mr. Peirce writes, successively pass through the stage of being thus half past and half to come, but that is by no means the same thing as saying that the present is half past, half to come, as Synechism avers. With our theory, as presented in the foregoing pages there is indeed no such difficulty, but Mr. Peirce, on the other hand, has elected to stand by infinitesimally measuring time, as applied to ideas etc., as separate from conceptual time, and must take the consequences of his decision. He says *the present, not the present idea.*

Now, in the concept time as a whole, in its entire range, a definite point may be selected—to the exclusion of other points—a point having position but not extension, as *the present.* Is it, then,—the present,—half past, half to come, as a timed idea is? Certainly not. There is nothing of the flow of a series in it. Further, this selection of the "now," as a point, does not interfere with its permanence. "Nowness" may persist. And the moment it partook, even infinitesimally, of the character of the past or of the future, it would cease to be the present. In the case of a series of ideas in time the difficulty is to get them all in present solution, as it were, without detriment to their evident continuity, but the definition of the present as a point in time presents no such difficulty. The conditions are quite distinct. Yet regarding this time point—the present—Mr. Peirce assures us that it is "half past, half to come," which is just that of which it is the precise negation, if words are to have any meaning.

Again, Mr. Peirce's *rationale* shows, upon the face of it, that there is (1) finitely divisible time and (2) time divided infinitesi-

mally, for what finite time could not do, in that it had limitations, the infinitesimal notation readily accomplishes. In its ulterior consequences, this is somewhat unfortunate for Synechism, inasmuch as the consciousness of ideas in continuity being confined to the infinitesimal theory, where, it may be asked, is the place, in consciousness, for the succession of finite intervals? Consciousness must be practically doubled, so to speak, if it is to hold both of these together. This is what comes of making one's world-scheme hang upon a mathematical subtlety—the subtlety in question partaking as a rule, more or less of the nature of an escape from the difficulties of the vulgar notation, the vulgar notation remains to be reckoned with, and both have to be credited to consciousness. As an instance of this take the following from Mr. Peirce's late article,* "Man's Glassy Essence"—p. 15:

"In order that a sub-molecule of food may be thoroughly and firmly assimilated into a broken molecule of protoplasm, it is necessary not only that it should have precisely the right chemical composition, but also that it should be at precisely the right spot *at the right time* and should be moving in precisely the right direction with precisely the right velocity. If all these conditions are not fulfilled, ... it will be in special danger of being thrown out again" (The italics are not in the original)."

Now here is a "time when" which can be exactly specified in accordance with the conditions. Certain results follow unless it is kept to. This is what Mr. Peirce would doubtless consider as a timed physical event, part and parcel of the regularity of matter, and yet an event which, in its own time and way, goes to account for both feeling and habit-taking—capable, therefore, of being stated in terms of finite time, as happening at a given instant, and neither before nor after it. But when this same molecule is, by virtue of keeping its appointment punctually, safely installed in feeling protoplasm, the succession of ideas, or feelings, of which, as subject, it is capable, obeys another rule—a given *instant* obtains no longer; it is the *moment* which is everything†—a moment half its predecessor,

* *The Monist*, Vol. III, No. 1.

† Mr. Peirce uses the word "instant" to mean a point of time, and "moment" to mean an infinitesimal duration.

half its successor. Even granted the function of the infinitesimal, this looks very much like a reduction to absurdity. For, if the above mentioned timed coalescence of the sub-molecule with the broken molecule were *also* a matter of subjective feeling, passed as process through a consciousness, the conclusion follows that the juncture of the molecules happens at two different times! There is no escape from this. Given the *instant* in the one case, the *moment* in the other, these two cannot possibly be the same point in time. The moment partakes, however insensibly, of the preceding and succeeding stages, the instant does not. Hence they are not the same but different times.

OTHERNESS.

The foregoing has a distinct bearing upon the question of "other selves" of which Mr. Peirce writes as follows:

> "The recognition by one person of another's personality takes place by means to some extent identical with the means by which he is conscious of his own personality. The idea of the second personality, which is as much as to say that second personality itself, enters within the field of direct consciousness of the first person, and is as immediately perceived as his ego, though less strongly. At the same time, the opposition between the two persons is perceived, so that the externality of the second is recognised." ("The Law of Mind," p. 558.)

This is the scheme of "otherness" which, in the case of the Neo-Kantians, particularly the French section, represented by M. Pillon, M. Renouvier, and others, has proved such a snare. To these thinkers, (as indeed to the late Prof. T. H. Green, of Oxford, though in a less degree,) the so-called external world lies in "other" thinking subjects—in "foreign centres of representations." The free-trade doctrine has verily penetrated to the philosophic region—the wholesale admission of foreign wares to the detriment of home products. Why should I place the content of that so-called external world, which, external or internal, is my very own inalienably, in a centre of representation other than my own, thus making my cognition of it rest entirely upon the "ejective" plane? It is only when I discover, as I must sooner or later, that there is nothing in the report of an "outsider" (or in any number of them) beyond what I credit him or her with in my own consciousness; and

that the outsider is on the same plane as other objects, it is only then that the mystification is cleared up. I do *not* cognise, or recognise, the external at second-hand. The "note" of otherness is simply another term more or less in the cosmical series.

It is, however, not only with the familiar "other selves" of ordinary life that we are confronted in Synechism. In the creed of animism

> "Millions of spiritual creatures walk the earth,"

and Mr. Peirce speaks of "spiritual influences" (p. 559) as having at least no hindrance presented to them by his doctrine. But he has some other shadowy personalities at command, which, it must be confessed, are well calculated to give us pause. "There should be something like* personal consciousness in bodies of men who are in intimate and intensely sympathetic communion. . . . None of us can fully realise which the minds of corporations are. . . . But the law of mind clearly points to the existence of such personalities." It is probably true that the "minds of corporations," must ever present an insoluble riddle of perversity to the suburban dweller, vexed with the mockery of paving and lighting. But we need not linger over this speculation, for there are other shades behind.

> "If such a fact is capable of being made out anywhere it should be in the Church. . . . Surely a personality ought to have developed in that Church, in that 'bride of Christ,' as they call it." ("Man's Glassy Essence," pp. 21–22.)

A PERSONAL CREATOR.

Bearing our ecclesiastical divisions in mind, it is difficult to conceive the unity of a "corporate personality" of this kind, but, to let that pass, it may be remarked that, when any one begins to imagine that there are others in the universe besides himself, he is not, as a rule, content with two or three companions of his solitude. They come in battalions. Thus, behind the other selves, corporate personalities and spiritual influences of Synechism, there looms a transcendent personality. "A genuine evolutionary philosophy," we are told, ". . . . is so far from being antagonistic to the idea of

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* The phrase, "something like," is significant, when we remember, (see *ante*,) that with Mr. Peirce the excitants were "something like" the excited feelings.

a personal creator, that it is really inseparable from that idea." And a philosophy of pseudo-evolutionism is "hostile to all hopes of personal relations to God." ("The Law of Mind," p. 557.)

Mr. Peirce thus assigns to his first cause a place in the *continuum* of ideas, and says that if there is a personal God we must have a direct perception of that person and "indeed be in personal communication with him." The difficulty, he admits, is that if this be so, how is it possible that the existence of this being should ever have been doubted by anybody. And the only answer he can at present make is, that "facts that stand before our face and eyes, and stare us in the face, are far from being in all cases the ones most easily discerned. That," he adds, "has been remarked from time immemorial." ("The Law of Mind," pp. 558–559.)

One of the ablest of living philosophical writers, Professor Veitch, of Glasgow University, puts it somewhat similarly, though with his own realistic coloring, when he says:

> "God, if at all, must rise above the line of finite regress; He cannot be a cause in that; He cannot be a cause dependent on another cause; He must be somewhere, or at some point, in the line of an otherwise endless scientific regress, there, above it, yet related to it, and in it; otherwise He is nothing for us." ("Knowing and Being," p. 320.)

The parallelism is worth noting. Those views embody what has been the contention of the present writer throughout this paper, *with this most notable difference*: that no term of a series may thus transcend the series, or be other than on a level with the other terms, being itself only a term, a link, in the series itself. And with this falls forever the idea of a cause uncaused.

Yet am *I* not *in* the series? For all that is in the series is mine every percept, every concept; so that, "extravagant" as it may appear, it is *I who am the series*. In other words, the ego is the universe-synthesis, and the universe-synthesis the ego.

Is Mr. Peirce prepared to take the consequences of that which his Synechism leads to?

G. M. McCrie.

THE FOURTH DIMENSION.

MATHEMATICAL AND SPIRITUALISTIC.

INTRODUCTORY.

THE tendency to generalise long ago led mathematicians to extend the notion of three-dimensional space, which is the space of sensible representation, and to define aggregates of points, or spaces, of more than three dimensions, with the view of employing these definitions as useful means of investigation. They had no idea of requiring people to imagine four-dimensional things and worlds, and they were even still less remote from requiring of them to believe in the real existence of a four-dimensioned space. In the hands of mathematicians this extension of the notion of space was a mere means devised for the discovery and expression, by shorter and more convenient ways, of truths applicable to common geometry and to algebra operating with more than three unknown quantities. At this stage, however, the spiritualists came in, and coolly took possession of this private property of the mathematicians. They were in great perplexity as to where they should put the spirits of the dead. To give them a place in the world accessible to our senses was not exactly practicable. They were compelled, therefore, to look around after some *terra incognita*, which should oppose to the spirit of research inborn in humanity an insuperable barrier. The residence of the spirits had to be a place inaccessible to our senses and full of mystery to the mind. This property the four-dimensioned space of the mathematicians possessed. With an intellectual perversity which science has no idea of, these spiritualists boldly asserted, first, that the whole world was so sit-

uated in a four-dimensioned space as a plane might be situated in the space familiar to us, secondly, that the spirits of the dead lived in such a four-dimensioned space, thirdly, that these spirits could accordingly act upon the world and, consequently, upon the human beings resident in it, exactly as we three-dimensioned creatures can produce effects upon things that are two-dimensional; for example, such effects as that produced when we shatter a lamina of ice, and so influence some possibly existing two-dimensioned *ice*-world.

Since spiritualism, under the leadership of the Leipsic Professor Zöllner, thus proclaimed the existence of a four-dimensioned space, this notion, which the mathematicians are thoroughly master of,—for in all their operations with it, though they have forsaken the path of actual representability, they have never left that of the truth,—this notion has also passed into the heads of lay persons who have used it as a catchword, ordinarily without having any clear idea of what they or any one else mean by it. To clear up such ideas and to correct the wrong impressions of cultured people who have not a technical mathematical training, is the purpose of the following pages. A similar elucidation was aimed at in the tracts which Schlegel (Riemann, Berlin, 1888) and Cranz (Virchow-Holtzendorff's Sammlung, Nos. 112 and 113) have published on the so-called fourth dimension. Both treatises possess indubitable merits, but their methods of presentation are in many respects too concise to give a lay mind any profound comprehension of the subject. The author, accordingly, has been able to add to the reflections which these excellent treatises offer, a great deal that appears to him necessary for a thorough explanation in the minds of non-mathematicians of the notion of the fourth dimension.

I.

THE CONCEPT OF DIMENSION.

Many text-books of stereometry begin with the words: "Every body has three dimensions, length, breadth, and thickness." If we should ask the author of a book of this description to tell us the length, breadth, and thickness of an apple, of a sponge, or of a cloud of tobacco smoke, he would be somewhat perplexed and would prob-

ably say, that the definition in question referred to something different. A cubical box, or some similar structure, whose angles are all right angles and whose bounding surfaces are consequently all rectangles is the only body of which it can at all be unmistakably asserted that there are three principal directions distinguishable in it, of which any one can be called the length, any other the breadth, and any third the thickness. We thus see that the notions of length, breadth, and thickness are not sufficiently clear and universal to enable us to derive from them any idea of what is meant when it is said that every body possesses three dimensions, or that the space of the world is three-dimensional.

This distinction may be made sharper and more evident by the following considerations: We have, let us suppose, a straight line on which a point is situated, and the problem is proposed to determine the position of the point on the line in an unequivocal manner. The simplest way to solve this is, to state how far the point is removed in the one or the other direction from some given fixed point; just as in a thermometer the position of the surface of the mercury is given by a statement of its distance in the direction of cold or heat from a predetermined fixed point—the point of freezing water. To state, therefore, the position of a point on a straight line, the sole datum necessary is a single number, for beforehand we have fixed upon some standard line, like the centimetre, and some definite point to which we give the value zero, and have also previously decided in what direction from the zero-point, points must be situated whose position is expressed by positive numbers, and also in what direction those must lie whose position is expressed by negative numbers. This last mentioned fact, that a *single* number is sufficient to determine the place of a point in a straight line, is the real reason why we attribute to the straight line or to any part of it a single dimension.

More generally, we call every totality or system, of infinitely numerous things, *one*-dimensional, in which *one* number is all that is requisite to determine and distinguish any particular one of these things amidst the entire totality. Thus, time is one-dimensional. We, as inhabitants of the earth, have naturally chosen as our unit

of time, the period of the rotation of the earth about its axis, namely, the day, or a definite portion of a day. The zero-point of time is regarded in Christian countries as the year of the birth of Christ, and the positive direction of time is the time *subsequent* to the birth of Christ. These data fixed, all that is necessary to establish and distinguish any definite point of time amid the infinite totality of all the points of time, *is a single number*. Of course this number need not be a whole number, but may be made up of the sum of a whole number and a fraction in whose numerator and denominator we may have numbers as great as we please. We may, therefore, also say that the totality of all conceivable numerical magnitudes, or of only such as are greater than one definite number and smaller than some other definite number, is one-dimensional.

We shall add here a few additional examples of one-dimensioned magnitudes presented by geometry. First, the circumference of a circle is a one-dimensional magnitude, as is every curved line, whether it returns into itself or not. Further, the totality of all equilateral triangles which stand on the same base is one-dimensional, or the totality of all circles that can be described through two fixed points. Also, the totality of all conceivable cubes will be seen to be one-dimensional, provided they are distinguished, not with respect to position, but with respect to magnitude.

In conformity with the fundamental ideas by which we define the notion of a one-dimensional manifoldness, it will be seen that the attribute *two*-dimensional must be applied to all totalities of things in which *two* numbers are necessary (and sufficient) to distinguish any determinate individual thing amid the totality. The simplest two-dimensioned complex which we know of is the plane. To determine accurately the position of a point in a plane, the simplest way is to take two axes at right angles to each other, that is, fixed straight lines, and then to specify the distances by which the point in question is removed from each of these axes.

This method of determining the position of a point in a plane suggested to the celebrated philosopher and mathematician Descartes the fundamental idea of analytical geometry, a branch of mathematics in which by the simple artifice of ascribing to every point in

a plane two numerical values, determined by its distances from the two axes above referred to, planimetrical considerations are transformed into algebraical. So, too, all kinds of curves that graphically represent the dependence of things on time, make use of the fact that the totality of the points in a plane is two-dimensional. For example, to represent in a graphical form the increase of the population of a city, we take a horizontal axis to represent the time, and a perpendicular one to represent the numbers which are the measures of the population. Any two lines, then, whose lengths practical considerations determine, are taken as the unit of time, which we may say is a year, and as the unit of population, which we will say is one thousand. Some definite year, say 1850, is fixed upon as the zero point. Then, from all the equally distant points on the horizontal axis, which points stand for the years, we proceed in directions parallel to the other axis, that is, in the perpendicular direction, just so much upwards as the numbers which stand for the population of that year require. The terminal points so reached, or the curve which runs through these terminal points, will then present a graphic picture of the rates of increase of the population of the town in the different years. The rectangular axes of Descartes are employed in a similar way for the construction of barometer curves, which specify for the different localities of a country the amount of variation of the atmospheric pressure during any period of time. Immediately next to the plane the surface of the earth will be recognised as a two-dimensional aggregate of points. In this case geographical latitude and longitude supply the two numbers that are requisite accurately to determine the position of a point. Also, the totality of all the possible straight lines that can be drawn through any point in space is two-dimensional, as we shall best understand if we picture to ourselves a plane which is cut in a point by each of these straight lines and then remember that by such a construction every point on the plane will belong to some one line and, *vice versa*, a line to every point, whence it follows that the totality of all the straight lines which pass through the point assigned are of the same dimensions as the totality of the points of the imagined plane.

The question might be asked, In what way and to what extent

in this case is the specification of *two* numbers requisite and sufficient to determine amid all the rays which pass through the specified point a definite individual ray? To get a clear idea of the problem here involved, let us imagine the ray produced far into the heavens, where some quite definite point will correspond to it. Now, the position of a point in the heavens depends, as does the position of a point on all spherical surfaces, on two numbers. In the heavens these two numbers are ordinarily supplied by the two angles called altitude, or the distance above the plane of the horizon, and azimuth, or the angular distance between the circle on which the altitude is measured and the meridian of the observer. It will be seen thus that the totality of all the luminous rays that an eye, conceived as a point, can receive from the outer world is two-dimensional, and also that a luminous point emits a two-dimensional group of luminous rays. It will also be observed, in connection with this example, that the two-dimensional totality of all the rays that can be drawn through a point in space is something different from the totality of the rays that pass through a point but are required to lie in a given plane. Such a group of objects as the last-named one, is a one-dimensional totality.

Now that we have sufficiently discussed the attributes that are characteristic of one and two-dimensional aggregates, we may, without any further investigation of the subject, propose the following definition, that, generally, *an n-dimensional totality of infinitely numerous things is such, with respect to which the specification of n numbers is necessary and sufficient to indicate a definite individual amid the totality of all the infinitely numerous individuals of the group.*

Accordingly, the point-aggregate made up of the world-space which we inhabit, is a three-dimensional totality. To get true bearings in this space and to define any determinate point in it, we have therefore to lay through any point which we take as our zero-point three axes at right angles to each other, one running from right to left, one backwards and forwards, and one upwards and downwards. We then join each two of these axes by a plane and are enabled thus to specify the position of every point in space by the three perpendicular distances by which the point in question is removed in a

positive or negative sense from these three planes. It is customary to denote the numbers which are the measures of these three distances by x, y, and z, the positive x, positive y, and positive z ordinarily being reckoned in the right hand, the forward, and the upward directions from the origin. If now, with direct reference to this fundamental axial system, any particular specification of x, y, and z be made, there will, by such an operation, be cut out and isolated from the three-dimensional manifoldness of all the points of space a totality of less dimensions. If, for example, z is equal to seven units or measures, this is equivalent to a statement that only the two-dimensional totality of the points is meant, which constitute the plane that can be laid at right angles to the upward-passing z-axis at a distance of seven measures from the zero-point. Consequently, every imaginable equation between x, y, and z isolates and defines a two-dimensional aggregate of points. If two different equations obtain between x, y, and z, two such two-dimensional totalities will be isolated from among all the points of space. But as these last must have some one-dimensional totality in common, we may say that the co-existence of two equations between x, y, and z defines a one-dimensional totality of points, that is to say a straight line, a line curved in a plane, or even, perhaps, one curved in space. It is evident from this that the introduction of the three axes of reference forms a bridge between the theory of space and the theory of equations involving three variable quantities, x, y, z. The reason that the theory of space cannot thus be brought into connection with algebra in general, that is, with the theory of indefinitely numerous equations, but only with the algebra of three quantities, x, y, z, is simply to be sought in the fact that space, as we picture it, can only have three dimensions.

We have now only to supply a few additional examples of n-dimensional totalities. All particles of air are four-dimensional in magnitude when in addition to their position in space we also consider the variable densities which they assume, as they are expressed by the different heights of the barometer in the different parts of the atmosphere. Similarly, all conceivable spheres in space are four-dimensional magnitudes, for their centres form a three-dimensional

point-aggregate, and around each centre there may be additionally conceived a one-dimensional totality of spheres, the radii of which can be expressed by every numerical magnitude from zero to infinity. Further, if we imagine a measuring stick of invariable length to assume every conceivable position in space, the positions so obtained will constitute a five-dimensional aggregate. For, in the first place, one of the extremities of the measuring stick may be conceived to assume a position at every point of space, and this determines for one extremity alone of the stick a three-dimensional totality of positions; and secondly, as we have seen above, there proceeds from every such position of this extremity a two-dimensional totality of directions, and by conceiving the measuring-stick to be placed lengthwise in every one of these directions we shall obtain all the conceivable positions which the second extremity can assume, and consequently, the dimensions must be 3 plus 2 or 5. Finally, to find out how many dimensions the totality of all the possible positions of a square, invariable in magnitude, possesses, we first give one of its corners all conceivable positions in space, and we thus obtain three dimensions. One definite point in space now being fixed for the position of one corner of the square, we imagine drawn through this point all possible lines, and on each we lay off the length of the side of the square and thus obtain two additional dimensions. Through the point obtained for the position of the second corner of the square we must now conceive all the possible directions drawn that are perpendicular to the line thus fixed, and we must lay off once more on each of these directions the side of the square. By this last determination the dimensions are only increased by one, for only one one-dimensional totality of perpendicular directions is possible to one straight line in one of its points. Three corners of the square are now fixed and therewith the position of the fourth also is uniquely determined. Accordingly, the totality of all equal squares which only differ from one another by their position in space, constitutes a manifoldness of six dimensions.

II.

THE INTRODUCTION OF THE NOTION OF FOUR-DIMENSIONAL POINT-AGGREGATES, PERMISSIBLE.

In the preceding section it was shown that we can conceive not only of manifoldnesses of one, two, and three dimensions, but also of manifoldnesses of *any* number of dimensions. But it was at the same time indicated that our world-space, that is, the totality of all conceivable *points* that differ only in respect of position, cannot in agreement with our notions of things possess more than three dimensions. But the question now arises, whether, if the progress of science tends in such a direction, it is permissible to extend the notion of space by the introduction of point-aggregates of more than three dimensions, and to engage in the study of the properties of such creations, although we know that notwithstanding the fact that we may conceptually establish and explore such aggregates of points, yet we cannot picture to ourselves these creations as we do the spatial magnitudes which surround us, that is, the regular three-dimensional aggregates of points.

To show the reader clearly that this question must be answered in the affirmative, that the extension of our notion of space is permissible, although it leads to things which we cannot perceive by our senses, I may call the reader's attention to the fact that in arithmetic we are accustomed from our youth upwards to extensions of ideas, which, accurately viewed, as little admit of graphic conception as a four-dimensional space, that is, a point-aggregate of four dimensions. By his senses man first reaches only the idea of whole numbers—the results of counting. The observation of primitive peoples* and of children clearly proves that the essential decisive factors of counting are these three: First, we abstract, in the counting of things, completely from the individual and characteristic attributes of these things, that is, we consider them as homogeneous. Second, we associate individually with the things which we count

* This is discussed at greater length in my tract *Zahl und Zählen* in Virchow-Holtzendorff's collection of popular essays, J. F. Richter, 1887.

other homogeneous things. These other things are even now, among uncivilised peoples, the ten fingers of the two hands. They may, however, be simple strokes, or, as in the case of dice and dominoes, black points on a white background. Third, we substitute for the result of this association some concise symbol or word; for example, the Romans substituted for three things counted, three strokes placed side by side, namely: III; but for greater numbers of things they employed abbreviated signs. The Aztecs, the original inhabitants of Mexico, had time enough, it seems, to express all the numbers up to nineteen by equal circles placed side by side. They had abbreviated signs only for the numbers 20, 400, 8000, and so forth. In speaking, some one same sound might be associated with the things counted; but this method of counting is nowadays employed only by clocks: the languages of men since prehistoric times have fashioned concise words for the results of the association in question. From the notion of number, thus fixed as the result of counting, man reached the notion of the addition of two numbers, and thence the notion that is the inverse of the last process, the notion of subtraction. But at this point it clearly appears that not every problem which may be propounded is soluble; for there is no number which can express the result of the subtraction of a number from one which is equally large or from one which is smaller than itself. The primary school pupil who says that 8 from 5 "won't go" is perfectly right from his point of view. For there really does not exist any result of counting which added to eight will give five.

If humanity had abided by this point of view and had rested content with the opinion that the problem "5 minus 8" is not solvable, the science of arithmetic would never have received its full development, and humanity would not have advanced as far in civilisation as it has. Fortunately, men said to themselves at this crisis: "If 5 minus 8 won't go, we'll *make it go;* if 5 minus 8 does not possess an intelligible meaning, we will simply give it one." As a fact, things which have not a meaning always afford men a pleasing opportunity of investing them with one. The question is, then, what significance is the problem "5 minus 8" to be invested with?

The most natural and, therefore, the most advantageous solution undoubtedly is to abide by the original notion of subtraction as the inverse of addition, and to make the significance of 5 minus 8 such, that for 5 minus 8 plus 8 we shall get our original minuend 5. By such a method all the rules of computation which apply to real differences will also hold good for unreal differences, such as 5 minus 8. But it then clearly appears that all forms expressive of differences in which the number that stands before the minus direction is less by an equal amount than that which follows it may be regarded as equal; so that the simplest course seems to be to introduce as the common characteristic of all equal differential forms of this description a common sign, which will indicate at the same time the difference of the two numbers thus associated. Thus it came about, that for 5 minus 8, as well as for every differential form which can be regarded as equal thereto the sign "— 3" was introduced. But in calling differential forms of this description numbers, the notion of number was extended and a new domain was opened up, namely, the domain of negative numbers.

In the further development of the science of arithmetic, through the operation of division viewed as the inverse of multiplication, a second extension of the idea of number was reached, namely, the notion of fractional numbers as the outcome of divisions that had led to numbers hitherto undefined. We find, thus, that the science of arithmetic throughout its whole development has strictly adhered to the principle of conformity and consistency and has invested every association of two numbers, which before had no significance, by the introduction of new numbers, with a real significance, such that similar operations in conformity with exactly the same rules could be performed with the new numbers, viewed as the results of this association, as with the numbers which were before known and perfectly defined. Thus the science proceeded further on its way and reached the notions of irrational, imaginary, and complex numbers.

The point in all this, which the reader must carefully note, is, that all the numbers of arithmetic, with the exception of the positive whole numbers, are artificial products of human thought, invented to make the language of arithmetic more flexible, and to ac-

celerate the progress of science. All these numbers lack the attributes of representability.

No man in the world can picture to himself "minus three trees." It is possible, of course, to know that when three trees of a garden have been cut down and carried away, that three are missing, and by substituting for "missing" the inverse notion of "added," we may says, perhaps, that "minus three trees" are added. But this is quite different from the feat of imagining a negative number of trees. We can only picture to ourselves a number of trees that results from actual counting, that is, a positive whole number. Yet, notwithstanding all this, people had not the slightest hesitation in extending the notion of number. Exactly so must it be permitted us in geometry to extend the notion of space, even though such an extension can only be mentally defined and can never be brought within the range of human powers of representation.

In mathematics, in fact, the extension of any notion is admissible, provided such extension does not lead to contradictions with itself or with results which are well established. Whether such extensions are necessary, justifiable, or important for the advancement of science is a different question. It must be admitted, therefore, that the mathematician is justified in the extension of the notion of space as a point-aggregate of three dimensions, and in the introduction of space or point-aggregates of more than three dimensions, and in the employment of them as means of research. Other sciences also operate with things which they do not know exist, and which, though they are sufficiently defined, cannot be perceived by our senses. For example, the physicist employs the ether as a means of investigation, though he can have no sensory knowledge of it. The ether is nothing more than a means which enables us to comprehend mechanically the effects known as action at a distance and to bring them within the range of a common point of view. Without the assumption of a material which penetrates everything, and by means of whose undulations impulses are transmitted to the remotest parts of space, the phenomena of light, of heat, of gravitation, and of electricity would be a jumble of isolated and unconnected mysteries. The assumption of an ether, however, comprises

in a systematic scheme all these isolated events, facilitates our mental control of the phenomena of nature, and enables us to produce these phenomena at will. But it must not be forgotten in such reflections that the ether itself is even a greater problem for man, and that the ether-hypothesis does not solve the difficulties of phenomena, but only puts them in a unitary conceptual shape. Notwithstanding all this, physicists have never had the least hesitation in employing the ether as a means of investigation. And as little do reasons exist why the mathematicians should hesitate to investigate the properties of a four-dimensioned point-aggregate, with the view of acquiring thus a convenient means of research.

III

THE INTRODUCTION OF THE IDEA OF FOUR-DIMENSIONED POINT-AGGREGATES OF SERVICE TO RESEARCH.

From the concession that the mathematician has the right to define and investigate the properties of point-aggregates of more than three dimensions, it does not necessarily follow that the introduction of an idea of this description is of value to science. Thus, for example, in arithmetic, the introduction of operations which spring from involution, as involution and its two inverse operations proceed from multiplication, is undoubtedly permitted. Just as for "a times a times a" we write the abbreviated symbol "a^3," (which we read, a to the third power,) and investigate in detail the operation of involution thus defined, so we might also introduce some shorthand symbol for "a to the a^{th} power to the a^{th} power" and thus reach an operation of the fourth degree, which would regard a as a passive number and the number 3, or any higher number, as the active number, that is, as the number which indicates how often a is taken as the base of a power whose exponent may be a, or "a to the a^{th}," or "a to the a^{th} to the a^{th} power."

But the introduction of such an operation of the fourth degree has proved itself to be of no especial value to mathematics. And the reason is that in the operation of involution the law of commutation does not hold good. In addition, the numbers to be added may be interchanged and the introduction of multiplication is therefore

of great value. So, also, in multiplication the numbers which are combined, that is, the factors, may be changed about in any way, and thus the introduction of involution is of value. But in involution the base and the exponent cannot be interchanged, and consequently the introduction of any higher operation is almost valueless.

But with the introduction of the idea of point-aggregates of multiple dimensions the case is wholly different. The innovation in question has proved itself to be not only of great importance to research, but the progress of science has irresistibly forced investigators to the introduction of this idea, as we shall now set forth in detail.

In the first place, algebra, especially the algebraical theory of systems of equations, derives much advantage from the notion of multiple dimensioned spaces. If we have only three unknown quantities, x, y, z, the algebraical questions which arise from the possible problems of this class admit, as we have above seen, of geometrical representation to the eye. Owing to this possibility of geometrical representation, some certain simple geometrical ideas like "moving," lying in," "intersecting," and so forth, may be translated into algebraical events. Now, no reason exists why algebra should stop at three variable quantities; it must in fact take into consideration any number of variable quantities.

For purposes of brevity and greater evidentness, therefore, it is quite natural to employ geometrical forms of speech in the consideration of more than three variables. But when we do this, we assume, perhaps without really intending to do so, the idea of a space of more than three dimensions. If we have four variable quantities, x, y, z, u, we arrive, by conceiving attributed to each of these four quantities every possible numerical magnitude, at a four-dimensioned manifoldness of numerical quantities, which we may just as well regard as a four-dimensioned aggregate of points. Two equations which exist on this supposition between x, y, z, and u, define two three dimensioned aggregates of points, which intersect, as we may briefly say, in a two-dimensioned aggregate of points, that is, in a surface; and so on. In a somewhat different manner the determination of the contents of a square or a cube by the involution of a

number which stands for the length of its sides, leads to the notion of four-dimensioned structures, and, consequently, to the notion of a four-dimensioned point-space. When we note that a^2 stands for the contents of a square, and a^3 for the contents of a cube, we naturally inquire after the contents of a structure which is produced from the cube as the cube is produced from the square and which also will have the contents a^4. We cannot, it is true, clearly picture to ourselves a structure of this description, but we can, nevertheless, establish its properties with mathematical exactness.* It is bounded by 8 cubes just as the cube is bounded by 6 squares; it has 16 corners, 24 squares, and 32 edges, so that from every corner 4 edges, 6 squares, and 4 cubes proceed, and from every edge 3 squares and 3 cubes.

Yet despite the great service to algebra of this idea of multiple-dimensioned space, it must be conceded that the conception although convenient is yet not indispensable. It is true, algebra is in need of the idea of multiple dimensions, but it is not so absolutely in need of the idea of *point*-aggregates of multiple dimensions.

This notion is, however, necessary and serviceable for a profound comprehension of geometry. The system of geometrical knowledge which Euclid of Alexandria created about three hundred years before Christ, supplied during a period of more than two thousand years a brilliant example of a body of conclusions and truths which were mutually consistent and logical. Up to the present century the idea of elementary geometry was indissolubly bound up with the name of Euclid, so that in England where people adhered longest to the rigid deductive system of the Grecian mathematician, the task of "learning geometry" and "reading Euclid" were until a few years ago identical. Every proposition of this Euclidian system rests on other propositions, as one building-stone in a house rests upon another. Only the very lowest stones, the foundations, were without supports. These are the axioms or fundamental proposi-

* Victor Schlegel, indeed, has made models of the three-dimensional nets of all the six structures which correspond in four-dimensioned space to the five regular bodies of our space, in an analogous manner to that by which we draw in a plane the nets of five regular bodies. Schlegel's models are made by Brill of Darmstadt.

tions, truths on which all other truths are, directly or indirectly, founded, but which themselves are assumed without demonstration as self-evident.

But the spirit of mathematical research grew in time more and more critical, and finally asked, whether these axioms might not possibly admit of demonstration. Especially was a rigid proof sought for the eleventh axiom of Euclid, which treats of parallels.

After centuries of fruitless attempts to prove Euclid's eleventh axiom, Gauss, and with him Bolyai and Lobatschewsky, Riemann and Helmholtz, finally stated the decisive reasons why any attempt to prove the axiom of the parallels must necessarily be futile. These reasons consist of the fact that though this axiom holds good enough in the world-space such as we do and can conceive it, yet three-dimensioned spaces are ideally conceivable though not capable of mental representation, where the axiom does not hold good. The axiom was thus shown to be a mere fact of *observation*, and from that time on there could no longer be any thought of a deductive demonstration of it. In view of the intimate connection, which both in an historical and epistemological point of view exists between the extension of the concept of space and the critical examination of the axioms of Euclid, we must enter at somewhat greater length into the discussion of the last mentioned propositions.

Of the axioms which Euclid premises to his geometry, only the following three are really geometrical axioms:

Eighth axiom: Magnitudes which coincide with one another are equal to one another.

Eleventh axiom: If a straight line meet two straight lines so as to make the two interior angles on the same side of it taken together less than two right angles, these straight lines, being continually produced, shall at length meet on that side on which are the angles which are less than two right angles.

Twelfth axiom: Two straight lines cannot inclose a [finite] space.

The numerous proofs which in the course of time were adduced in demonstration of these axioms, especially of the eleventh, all turn out on close examination to be pseudo-proofs. Legendre drew at-

tention to the fact that either of the following axioms might be substituted for the eleventh:

a) Through a point there can be drawn to a straight line, within the plane which joins the point with the line, one and one line only which shall not intersect the first (parallels) however far the two lines may be produced;

b) If two parallel lines are cut by a third straight line, the interior alternate angles will be equal.

c) The sum of the angles of a triangle is equal to two right angles, that is, to the angle of a straight line or 180°.

By the aid of any one of these three assertions, the eleventh axiom of Euclid may be proved, and, *vice versa*, by the aid of the latter each of the three assertions may be proved, of course with the help of the other two axioms, eight and twelve. The perception that the eleventh axiom does not admit of demonstration without the employment of one of the foregoing substitutes may best be gained from the consideration of congruent figures. Every reader will remember from his first instruction in geometry that the congruence of two triangles is demonstrated by the superposition of one triangle on the other and by then ascertaining whether the two completely coincide, no assumptions being made in the determination except those above mentioned.

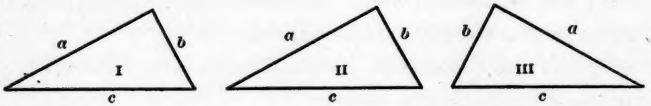

Fig. 1.

In the case of triangles which are congruent as are I and II in the preceding cut, this coincidence may be effected by the simple *displacement* of one of the triangles; so that even a two-dimensional being, supposed to be endowed with powers of reasoning, but only capable of picturing to itself motions within a plane, also might convince itself that the two triangles I and II could be made to coincide. But a being of this description could not convince itself in like manner of the congruence of triangles I and III. It would discover the equality of the three sides and the three angles, but it

could never succeed in so superposing the two triangles on each other as to make them coincide. A three-dimensioned being, however, can do this very easily. It has simply to turn triangle I about one of its sides and to shove the triangle, thus brought into the position of its reflection in a mirror, into the position of triangle III. Similarly, triangles II and III may be made to coincide by moving either out of the plane of the paper around one of its sides as axis and turning it until it again falls in the plane of the paper. The triangle thus turned over can then be brought into the position of the other.

Later on we shall revert to these two kinds of congruence: "congruence by displacement" and "congruence by circumversion." For the present we will start from the fact that it is always possible within the limits of a plane to take a triangle out of one position and bring it into another without altering its sides and angles. The question is, whether this is only possible in the plane, or whether it can also be done on other surfaces.

We find that there are certain surfaces in which this is possible, and certain others in which it is not. For instance, it is impossible to move the triangle drawn on the surface of an egg into some other position on the egg's surface without a distension or contraction of some of the triangle's parts. On the other hand, it is quite possible to move the triangle drawn on the surface of a sphere into any other position on the sphere's surface without a distension or contraction of its parts. The mathematical reason of this fact is, that the surface of a sphere, like the plane, has everywhere the same curvature, but that the surface of an egg at different places has different curvatures. Of a plane we say that it has everywhere the curvature zero; of the surface of a sphere we say it has everywhere a positive curvature, which is greater in proportion as the radius is smaller. There are surfaces also which have a constant negative curvature; these surfaces exhibit at every point in directions proceeding from the same side a partly concave and a partly convex structure, somewhat like the centre of a saddle. There is no necessity of our entering in any detail into the character and structure of the last-mentioned surfaces.

Intimately related with the plane, however, are all those surfaces, which, like the plane, have the curvature zero; in this category belong especially cylindrical surfaces and conical surfaces. A sheet of paper of the form of the sector of a circle may, for example, be readily bent into the shape of a conical surface. If two congruent triangles, now, be drawn on the sheet of paper, which may by displacement be translated the one into the other, these triangles will, it is plain, also remain congruent on the conical surface; that is, on the conical surface also we may displace the one into the other; for though a bending of the figures will take place, there will be no distension or contraction. Similarly, there are surfaces which, like the sphere, have everywhere a constant positive curvature. On such surfaces also every figure can be transferred into some other position without distension or contraction of its parts. Accordingly, on all surfaces thus related to the plane or sphere, the assumption which underlies the eighth axiom of Euclid, that it is possible to transfer into any new position any figure drawn on such surfaces without distortion, holds good.

The eleventh axiom in its turn also holds good on all surfaces of constant curvature, whether the curvature be zero or positive; only in such instances instead of "straight" line we must say "shortest" line. On the surface of a sphere, namely, two shortest lines, that is, arcs of two great circles, always intersect, no matter whether they are produced in the direction of the side at which the third arc of a great circle makes with them angles less than two right angles, or, in the direction of the other side, where this arc makes with them angles of more than two right angles. On the plane, however, two straight lines intersect only on the side where a third straight line that meets them makes with them interior angles less than two right angles.

The twelfth axiom of Euclid, finally, only holds good on the plane and on the surfaces related to it, but not on the sphere or other surfaces which, like the sphere, have a constant positive curvature. This also accounts for the fact that one of the three postulates which we regarded as substitutes for the eleventh axiom, though valid for the plane, is not true for the surface of a sphere; namely,

the postulate that defines the sum of the angles of a triangle. This sum in a plane triangle is two right angles; in a spherical triangle it is more than two right angles, the spherical triangle being greater, the greater the excess the sum of its angles is above two right angles. It will be seen, from these considerations, that in geometries in which curved surfaces and not fixed planes are studied, the axioms of Euclid are either all or partially false.

The axioms of geometry thus having been revealed as facts of experience, the question suggested itself whether in the same way in which it was shown that different two-dimensional geometries were possible, also different three-dimensional systems of geometry might not be developed; and consequently what the relations were in which these might stand to the geometry of the space given by our senses and representable to our mind. As a fact, a three-dimensional geometry can be developed, which like the geometry of the surface of an egg will exclude the axiom that a figure or body can be transferred from any one part of space to any other and yet remain congruent to itself. Of a three-dimensional space in which such a geometry can be developed we say, that it has no constant measure of curvature.

The space which is representable to us, and which we shall henceforth call the *space of experience*, possesses, as our experiences without exception confirm, the especial property that every bodily thing can be transferred from any one part of it to any other without suffering in the transference any distension or any contraction. The space of experience, therefore, has a constant measure of curvature. The question, however, whether this measure of curvature is zero or positive, that is, whether the space of experience possesses the properties which in two-dimensioned structures a plane possesses, or whether it is the three-dimensioned analogon of the surface of a sphere is one which future experience alone can answer. If the space of experience has a constant positive measure of curvature which is different from zero, be the difference ever so slight, a point which should move forever onward in a straight line, or, more accurately expressed, in a shortest line, would sometime, though perhaps after having traversed a distance which to us is inconceivable,

ultimately have to arrive from the opposite direction at the place from which it set out, just as a point which moves forever onward in the same direction on the surface of a sphere must ultimately arrive at its starting point, the distance it traverses being longer the greater the radius of the sphere or the smaller its curvature.

It will seem, at first blush, almost incredible, that the space of experience even *can* have this property. But an example, which is the historical analogon of this modern transformation of our conceptions, will render the idea less marvellous. Let us transport ourselves back to the age of Homer. At that time people believed that the earth was a great disc surrounded on all sides by oceans which were conceived to be in all directions infinitely great. Indeed, for the primitive man, who has never journeyed far from the place of his birth, this is the most natural conception. But imagine now that some scholar had come, and had informed the Homeric hero Ulysses that if he would travel forever on the earth in the same direction he would ultimately come back to the point from which he started; surely Ulysses would have gazed with as much astonishment upon this scholar as we now look upon the mathematician who tells us that it is possible that a point which moves forever onward in space in the same direction may ultimately arrive at the place from which it started. But despite the fact that Ulysses would have regarded the assertion of the scholar as false because contradictory to his familiar conceptions, that scholar, nevertheless, would have been right; for the earth is not a plane but a spherical surface. So also the mathematician might be right who bases this more recent strange view on the possible fact that the space of experience may have a measure of curvature which is not exactly zero but slightly greater than zero. If this were really the case, the *volume* of the space of experience, though very large, would, nevertheless, be finite; just as the real spherical surface of the earth as contrasted with the Homeric plane surface is finite, having so and so many square miles. When the objection is here made that a finiteness of space is totally at variance with our modes of thought and conceptions, two ideas, "infinitely great" and "unlimited," are confounded. All that is at variance with our practical conceptions is that space can anywhere

have a limit; not that it may possibly be of tremendous but finite magnitude.

It will now be asked if we cannot determine by actual observation whether the measure of curvature of experiential space is exactly zero or slightly different therefrom. The theorem of the sum of the angles of a triangle and the conclusions which follow from this theorem do indeed supply us with a means of ascertaining this fact. And the results of observation have been, that *the measure of curvature of space is in all probability exactly equal to zero or if it is slightly different from zero it is so little so that the technical means of observation at our command and especially our telescopes are not competent to determine the amount of the deviation.* More, we cannot with any certainty say.

All these reflections, to which the criticism of the hypotheses that underlie geometry long ago led investigators, compel us to institute a comparison between the space of experience and other three-dimensioned aggregates of points (spaces), which we cannot mentally represent but can in thought and word accurately define and investigate. As soon, however, as we are fully involved in the task of accurately investigating the properties of three-dimensional aggregates of points, we similarly find ourselves forced to regard such aggregates as the component elements of a manifoldness of more than three dimensions. In this way the exact criticism of even ordinary geometry leads us to the abstract assumption of a space of more than three dimensions. And as the extension of every idea gives a clearer and more translucent form to the idea as it originally stood, here too the idea of multiple-dimensioned aggregates of points and the investigation of their properties has thrown a new light on the truths of ordinary geometry and placed its properties in clearer relief. Amid the numerous examples which show how the notion of a space of multiple-dimensions has been of great service to science in the investigation of three-dimensioned space, we shall give one a place here which is within the comprehension of non-mathematicians.

Imagine in a plane two triangles whose angles are denoted by pairs of numbers—namely, by 1-2, 1-3, 1-4, and 2-5, 3-5, 4-5.

(See Fig. 2.) Let the two triangles so lie that the three lines which join the angles 1-2 and 2-5, 1-3 and 3-5, and 1-4 and 4-5 intersect at a point, which we will call 1-5. If now we cause the sides of the triangles which are opposite to these angles to intersect, it will be found that the points of intersection so obtained possess the peculiar property of lying all in one and the same straight line. The point of intersection of the connection 1-3 and 1-4 with the connection 4-5 and 3-5 may appropriately be called 3-4. Similarly, the point of intersection 2-4 is produced by the meeting of 4-5, 2-5 and 1-2, 1-4; and the point of intersection 2-3, by the meeting of 1-3, 1-2 and 3-5, 2-5. The statement, that the three points of intersection 3-4, 2-4, 2-3, thus obtained, lie in one straight line, can be proved by the principles of plane geometry only with difficulty and great circumstantiality. But by resorting to the three-dimensional space of experience, in which the plane of the drawing lies, the proposition may be rendered almost self-evident.

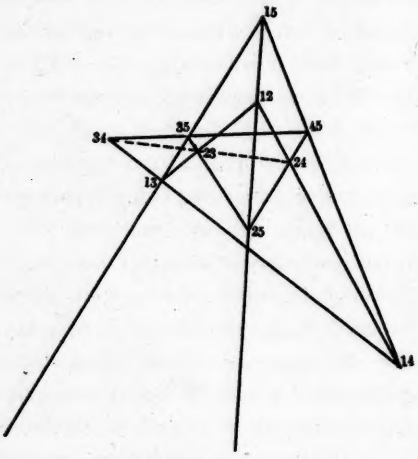

Fig. 2.

To begin with, imagine any five points in space which may be denoted by the numbers 1, 2, 3, 4, 5; then imagine all the possible ten straight lines of junction drawn between each two of these points, namely, 1-2, 1-3 . . . . 4-5; and finally, also, all the ten planes of junction of every three points described, namely, the plane 1-2-3, 1-2-4, ... 3-4-5. A spatial figure will thus be obtained, whose ten straight lines will meet some interposed plane in ten points whose relative positions are exactly those of the ten points above described. Thus, for example, on this plane the points 1-2, 1-3, and 2-3 will lie in a straight line, for through the three spatial points 1, 2, 3, a plane can

be drawn which will cut the plane of a drawing in a straight line. The reason, therefore, that the three points 3-4, 2-4, 2-3, also must ultimately lie in a straight line, consists in the simple fact that the plane of the three points 2, 3, 4, must cut the plane of the drawing in a straight line. The figure here considered consists of ten points of which sets of three so lie ten times in a straight line that conversely from every point also three straight lines proceed.

Now, just as this figure is a section of a complete three-dimensional pentagon, so another remarkable figure, of similar properties, may be obtained by the section of a figure of four-dimensioned space. Imagine, namely, six points, 1, 2, 3, 4, 5, 6, situated in

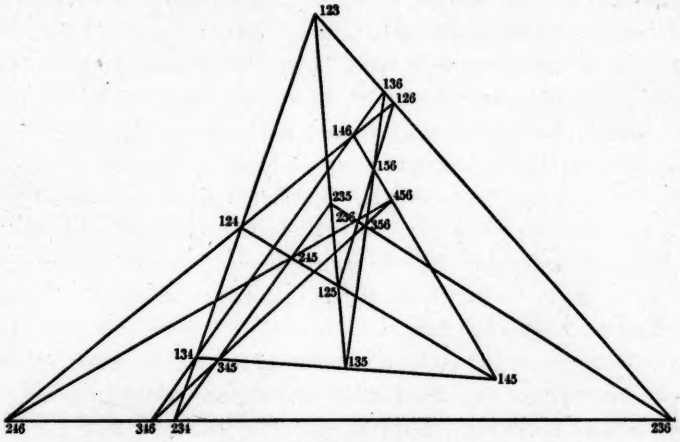

Fig. 3.

this four-dimensioned space, and every three of them connected by a plane, and every four of them by a three-dimensioned space. We shall obtain thus twenty planes and fifteen three-dimensioned spaces which will cut the plane in which the figure is to be produced in twenty points and fifteen rays which so lie that each point sends out three rays and every ray contains four points. (See Fig. 3.) Figures of this description, which are so composed of points and rays that an equal number of rays proceed from every point and an equal number of points lie in every ray, are called *configurations*. Other configurations may, of course, be produced, by taking a different

number of points and by assuming that the points taken lie in a space of different or even higher dimensions. The author of this article was the first to draw attention to configurations derived from spaces of higher dimensions. As we see, then, the notion of a space of more than three dimensions has performed important work in the investigations of common plane geometry.

In conclusion, I should like to add a remark which Cranz makes regarding the application of the idea of multiple-dimensioned space to theoretical chemistry. (See the treatise before cited.) In chemistry, the molecules of a compound body are said to consist of the atoms of the elements which are contained in the body, and these are supposed to be situated at certain distances from one another, and to be held in their relative positions by certain forces. At first, the centres of the atoms were conceived to lie in one and the same plane. But Wislicenus was led by researches in paralactic acid to explain the differences of isomeric molecules of the same structural formulæ by the different positions of the atoms in *space*. (Compare "La chimie dans l'espace" by van't Hoff, 1875, preface by J. Wislicenus). In fact four points can always be so arranged in space that every two of them may have any distance from each other; and the change of one of the six distances does not necessarily involve the alteration of any other.

But suppose our molecule consists of five atoms? Four of these may be so placed that the distance between any two of them can be made what we please. But it is no longer possible to give the fifth atom a position such that each of the four distances by which it is separated from the other atoms may be what we please. Quite the contrary, the fourth distance is dependent on the three remaining distances; for the space of experience has only three dimensions. If, therefore, I have a molecule which consists of five atoms I cannot alter the distance between two of them without at least altering some second distance. But if we imagine the centres of the atoms placed in a four-dimensioned space, this can be done; all the ten distances which may be conceived to exist between the five points will then be independent of one another. To reach the same result

in the case of six atoms we must assume a five-dimensional space; and so on.

Now, if the independence of all the possible distances between the atoms of a molecule is absolutely required by theoretical chemical research, the science is really compelled, if it deals with molecules of more than four atoms, to make use of the idea of a space of more than three dimensions. This idea is, in this case, simply an instrument of research, just as are, also, the ideas of molecules and atoms—means designed to embrace in an obvious and systematic form the phenomena of chemistry and to discover the conditions under which new phenomena can be evoked. Whether a four-dimensioned space really exists is a question whose insolubility cannot prevent research from making use of the idea, exactly as chemistry has not been prevented from making use of the notion of atom, although no one really knows whether the things we call atoms exist or not.

IV.

REFUTATION OF THE ARGUMENTS ADDUCED TO PROVE THE EXISTENCE OF A FOUR-DIMENSIONED SPACE INCLUSIVE OF THE VISIBLE WORLD.

The considerations of the preceding section will have convinced the cultured non-mathematician of the service which the theory of multiple-dimensioned spaces has done, and bids fair to do, for geometrical research. In addition thereto is the consideration that every extension of one branch of mathematical science is a constant source of beneficial and helpful influence to the other branches. The knowledge, however, that mathematicians can employ the notion of four-dimensioned space with good results in their researches, would never have been sufficient to procure it its present popularity; for every man of intelligence has now heard of it, and, in jest or in earnest, often speaks of it. The knowledge of a four-dimensioned space did not reach the ears of cultured non-mathematicians until the consequences which the spiritualists fancied it was permissible to draw from this mathematical notion were publicly known. But it is a tremendous step from the four-dimensioned space of the mathemati-

cians to the space from which the spirit-friends of the spiritualistic mediums entertain us with rappings, knockings, and bad English. Before taking this step we will first discuss the question of the real existence of a four-dimensional space, not judging the question whether this space, if it really does exist, is inhabited by reasonable beings who consciously act upon the world in which we exist.

Among the reasons which are put forward to prove the existence of a four-dimensional space containing the world, the least reprehensible are those which are based on the existence of symmetry. We spoke above of two triangles in the same plane which have all their sides and angles congruent, but which cannot be made to coincide by simple displacement within the plane; but we saw that this

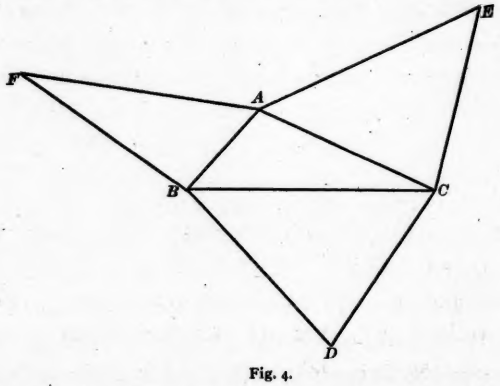

Fig. 4.

coincidence could be effected by holding fast one side of one triangle and moving it out of its plane until it had been so far turned round that it fell back into its plane. Now something similar to this exists in space. Cut two figures, exactly like that of Fig. 4, out of a piece of paper, and turn the triangle ABF about the side AB, ACE about the side AC, BCD about the side BC, and in one figure above and in the other below; then in both cases the points D, E, F will meet at a point, because AE is equal to AF, BF is equal to BD, CD is equal to CE. In this manner we obtain two pyramids which in all lengths and all angles are congruent, yet which cannot, no matter how we try, be made to coincide, that is, be so fitted the one into the other that they shall both stand as one pyra-

mid. But the *reflected* image of the one could be brought into coincidence with the other. Two spatial structures whose sides and angles are thus equal to each other, and of which each may be viewed as the reflected image of the other, are called *symmetrical.* For instance, the right and the left hand are symmetrical; or, a right and a left glove. Now just as in two dimensions it is impossible by simple displacement to bring into congruence triangles which like those above mentioned can only be made to coincide by circumversion, so also in three dimensions it is impossible to bring into congruence two symmetrical pyramids. Careful mathematical reflection, however, declares, that this could be effected if it were possible, while holding one of the surfaces, to move the pyramid out of the space of experience, and to turn it round through a four-dimensioned space until it reached a point at which it would return again into our experiential space. This process would simply be the four-dimensional analogon of the three-dimensional circumversion in the above-mentioned case of the two triangles. Further, the interior surfaces in this process would be converted into exterior surfaces, and *vice versa*, exactly as in the circumversion of a triangle the anterior and posterior sides are interchanged. If the structure which is to be converted into its symmetrical counterpart is made of a flexible material, the interchange mentioned of the interior and exterior surfaces may be effected by simply turning the structure inside out; for example, a right glove may thus be converted into a left glove.

Now from this truth, that every structure can be converted by means of a four-dimensional space inclusive of the world, into a structure symmetrical with it, it has been sought to establish the probability of the real existence of a four-dimensioned space. Yet it will be evident, from the discussions of the preceding section, that the only inference which we can here make is, that the idea of a four-dimensioned space is competent, from a mathematical point of view, to throw some light upon the phenomena of symmetry. To conclude from these facts that a space of this kind really exists, would be as daring as to conclude from the fact that the uniform angular velocity of the apparent motions of the fixed stars is expli-

cable from the assumption of an axial motion of the firmament, that the fixed stars are really rigidly placed in a celestial sphere rotating about its axis. It must not be forgotten that our comprehension of the phenomena of the real world consists of two elements: first, of that which the things really are; and, second, of that by which we rationally apprehend the things. This latter element is partly dependent on the sum of the experiences which we have before acquired, and partly on the necessity, due to the imperfection of reason, of our embracing the multitudinous isolated phenomena of the world into categories which we ourselves have formed, and which, therefore, are not wholly derived from the phenomena themselves, but to a great extent are dependent on us.

Besides geometrical reasons, Zöllner has also adduced cosmological reasons to prove the existence of a four-dimensional space. To these reasons belong especially the questions whether the number of the fixed stars is infinitely great, whether the world is finite or infinite in extension, whether the world had a beginning or will have an end, whether the world is not hastening towards a condition of equilibrium or dead level by the universal distribution of its matter and energy; the problems, also, of gravitation and action at a distance; and finally, the questions concerning the relations between the phenomena in the world of sense-perception to the unknown things-in-themselves. All these questions which can be decided in no definite sense, led Zöllner and his followers to the assumption that a four-dimensioned space inclusive of the space of experience must really exist. But more careful reflection will show that this assumption does not dispose of the difficulties but simply displaces them into another realm. Furthermore, even if four-dimensioned space did unravel and make clear all the cosmological problems which have bothered the human mind, still, its existence would not be proved thereby; it would yet remain a mere hypothesis, designed to render more intelligible to a being who can only make experiences in a three-dimensional space, the phenomena therein which are full of mystery to it. A four-dimensioned space would in such case possess for the metaphysician a value similar to that which the ether possesses for the physicist. Still more convincing than these cos-

mological reasons to the majority of men is the physio-psychological reason drawn from the phenomena of vision which Zöllner adduces. Into this main argument we will enter in more detail.

When we "see" an object, as we all know, the light which proceeds or is reflected therefrom produces an image on the retina of our eye; this image is conducted to our consciousness by means of the optical nerve, and our reason draws therefrom an inference respecting the object. When, now, we look at a square whose sides are a decimetre in length, and whose centre is situated at the distance of a metre from the pupil of our eye, an image is produced on the retina. But exactly the same image will be produced there if we look at a square whose sides are parallel to the sides of the first square but two decimetres in length, and whose centre is situated at a distance of two metres from the pupil of the eye. Proceeding thus further, we readily discover that an eye can perceive in any length or line only the ratio of its magnitude to the distance at which it is situated from it, and that generally a three-dimensional world must appear to the eye two-dimensional, because all points which lie behind each other in the direction outwards from the eye produce on the retina only one image. This is due to the fact that the retinal images are themselves two-dimensional; for which reason, Zöllner says, the world must appear to a child as two-dimensional, if it be supposed to live in a primitive condition of unconscious mental activity. To such a child two objects which are moving the one behind the other, must appear as suffering displacement on a surface, which we conceive behind the objects, and on which the latter are projected. In all these apparent displacements, coincidences and changes of form also are effected. All these things must appear puzzling to a human being in the first stages of its development, and the mind thus finds itself, as Zöllner further argues, in the first years of childhood forced to adopt a hypothesis concerning the constitution of space and to assume that the world is three-dimensional, although the eye can really perceive it as only two-dimensional. Zöllner then further says, that in the explanation of the effects of the external world, man constantly finds this hypothesis of his childish years confirmed, and that in this way it has become in his mind

so profound a conviction that it is no longer possible for him to think it away. Consonant with this argumentation, also, is Zöllner's remark, that the same phenomenon has presented itself in astronomical methods of knowledge. To explain the movements of the planets, which appear to describe regular paths on the surface of a celestial sphere, we were compelled in the solution of the riddles which these motions presented, to assume in the structure of the heavens a dimension of "depth," and the complicated motions in the two-dimensioned firmament were converted into very simple motions in three-dimensioned space. Zöllner also contends that our conception of the entire visible world as possessed of three dimensions is a product of our reason, which the mind was driven to form by the contradictions which would be presented to it on the assumption of only two dimensions by the perspective distortions, coincidences, and changes of magnitude of objects. When a child moves its hand before its eyes, turns it, brings it nearer, or pushes it farther away, this child successively receives the most various impressions on the surface of its retina of one and the same object of whose identity and constancy its feelings offer it a perfect assurance. If the child regarded the changeable projection of the hand on the surface of the retina as the real object, and not the hand which lies beyond it, the child would constantly be met with contradictions in its experience, and to avoid this it makes the hypothesis that the space of experience is three-dimensional. Zöllner's contention is, therefore, that man originally had only a two-dimensional intuition of space, but was forced by experience to represent to himself the objects which on the retinal surface appeared two-dimensional, as three-dimensional, and thus to transform his two-dimensional space-intuition into a three-dimensional one. Now, in exactly the same way, according to Zöllner's notion, will man, by the advancement and increasing exactness of his knowledge of the phenomena of the outer world, also be compelled to conceive of the material world as a "shadow cast by a more real four-dimensional world," so that these conceptions will be just as trivial for the people of the twentieth century as since Copernicus's time the explanation of the mo-

tions of the heavenly bodies by means of a three-dimensional motion has been.

Zöllner's arguments from the phenomena of vision may be refuted as follows: In the first place it is incorrect to say that we see the things of the external world by means of two-dimensional retinal images. The light which penetrates the eye causes an irritation of the optical nerves, and any such effect which, though it be not powerful, is, nevertheless, a mechanical one, can only take place on things which are material. But material things are always three-dimensional. The effect of light on the sensitive plates of photography can with just as little justice be regarded as two-dimensional. Our senses can have perception of nothing but three-dimensional things, and this perception is effected by forces which in their turn act on three-dimensional things, namely, our sensory nerves. It is wrong to call an image two-dimensional, for it is only by abstraction that we can conceive of a thickness so growing constantly smaller and smaller as to admit of our regarding a three-dimensional picture as two-dimensional, by giving it in mind a vanishingly small thickness. It is also wrong to say, as Zöllner says, that when we see the shadow of a hand which is cast upon a wall we see something two-dimensional. What we really perceive is that no light falls upon our eye from the region included by the shadow, while from the entire surrounding region light does fall on our eye. But this light is reflected from the material particles which form the surface of the wall, that is, from three-dimensional particles of matter. We must always remember that our eye communicates to us only three-dimensional knowledge, and that for the comprehension of anything which has two, one, or no dimensions, *a purely intellectual act of abstraction must be added to the act of perception.* When we imagine we have made a lead-pencil mark on paper, we have, exactly viewed, simply heaped along side of each other little particles of graphite in such a manner that there are by far fewer graphite particles in the lateral and upward directions than there are in the longitudinal direction, and thus our reason arrives by abstraction at the notion of a straight line. When we look at an object, say a cube of wood, we recognise the object as three-dimensional, and it is only by abstraction that we

can conceive of its two-dimensional surfaces, of its twelve one-dimensional edges, and of its eight no-dimensional corners. For we reach the perception of its surface, for example, solely by reason of the fact that the material particles which form the cube prevent the transmission of light, and reflect it, whereby a part of the light reflected from every material particle strikes our eye. Now, by thinking exclusively of those material particles which are reflected, in contrariety to the empty space without and the hidden and therefore non-reflected particles within, we form the notion of a surface.

It is evident from this, that all that we perceive is three-dimensional, that we cannot come at anything two-dimensional without an intellectual abstraction, and that, therefore, we cannot conceive of anything two-dimensional exerting effects upon material things. But this fact is a refutation of the retinal argument of Zöllner. If vision consisted wholly and exclusively in the creation of a two-dimensioned image, the things which take place in the world could never come into our consciousness. The child, therefore, does not originally apprehend the world, as Zöllner says, as two-dimensional; on the contrary, it apprehends it either not at all, or it apprehends it as three-dimensional. Of course the child must first "learn how" to see. It is found from the observation of children during the first months of their lives, and of the congenitally blind, who have suddenly acquired the power of vision by some successful operation, that seeing does not consist alone in the irritations which arise in the optic nerves, but also in the correct interpretation of these irritations by reason. This correct interpretation, however, can be accomplished only by the accumulation of a considerable stock of experience. Especially must the recognition of the distance of the object seen, be gradually learned. In this, two things are especially helpful; first, the fact that we have two eyes and, consequently, that we must feel two irritations of the optic nerves which are not wholly alike; and secondly, the fact that we are enabled by our power of motion and our sense of touch to convince ourselves of the distance and form of the bodies seen. The question now arises, what sort of an intuition of space would a creature have that had only one eye, that could neither move itself nor its eye, and also possessed no

peripheral nerves. According to Zöllner's view, this creature could, owing to its two-dimensional retinal images, only have a two-dimensional intuition of space. The author's opinion, however, is, that such a creature could not see at all, as it has no possibility of collecting experiences which are adapted in any way to interpreting the effects of things on its retina. The light which proceeded from the objects roundabout and fell on the retina could produce no other effect on the being than that of a wholly intelligible irritation, or, perhaps, even pain.

The reflections presented sufficiently show that neither the phenomena of symmetry nor the retinal images of the objects of vision necessarily force upon us the assumption of a four-dimensioned space. If the material world should ever present problems which could not in the progress of knowledge be solved in a natural way, the assumption that a four-dimensional space containing the world exists would also be incompetent to resolve the difficulties presented; it would simply convert these difficulties into others, and not dispose of the problems but simply displace them to another world. Yet the question might be asked, Is the existence of a four-dimensional space really *impossible*? To answer this question, we must first clearly know what we mean by "exist." If existence means that the intellectual *idea* of a thing can be formed and that this idea shall not lead to contradictions with other well-established ideas and with experience, we have only to say that four-dimensioned space does exist, as the arguments adduced in sections II and III have rendered plain. If, namely, the space of four dimensions did not exist as a clear idea in the minds of mathematicians, mathematicians could certainly not have been led by this idea to results which are recognised by the senses as true, and which really take place in our own representable space. But if existence means "material actuality" we must say that we neither now nor in the future can know anything about it. For we know material actuality only as three-dimensional, our senses can only make three-dimensional experiences, and the inferences of our reason, although they can well abstract from material things, can never ascend to the point of explaining a four-dimensional materiality. Just as little, therefore, as we can

locally fix the idea of a two-dimensional material world, as little can we substantiate the notion of a four-dimensioned material existence.

V.

EXAMINATION OF THE HYPOTHESIS CONCERNING THE EXISTENCE OF FOUR-DIMENSIONAL SPIRITS.

In connection with the belief that the visible world is contained in a four-dimensioned space, Zöllner and his adherents further hold that this higher space is inhabited by intelligent beings who can act consciously and at will on the human beings who live in experiential space. To invest this opinion with greater strength Zöllner appealed to the fact that the greatest thinkers of antiquity and of modern times were either wholly of this opinion or at least held views from which his contentions might be immediately derived. Plato's dialogue between Socrates and Glaukon in the seventh book of the Republic, is evidence, says Zöllner, that this greatest philosopher of antiquity possessed some presentiment of this extension of the notion of space. Yet any one who has connectedly studied and understood Plato's system of philosophy must concede that the so-called "ideas" of the Platonic system denote something wholly different from what Zöllner sees in them or pretends to see. Zöllner says that these Platonic ideas are spatial objects of more than three dimensions and represent "real existence" in the same sense that the material world, as contrasted with the images on the retina, represents it. Zöllner similarly deals with the Kantian "thing-in-itself," which is also regarded as an object of higher dimensions.

To show Kant in the light of a predecessor, Zöllner quotes the following passage from the former's "Träume eines Geistersehers, erläutert durch Träume der Metaphysik" (1766, Collected Works, Vol. VII, page 32 et seqq.): "I confess that I am very much inclined to assert the existence of immaterial beings in the world, and to rank my own soul as one of such a class. It appears, there is a spiritual essence existent which is intimately bound up with matter but which does not act on those forces of the elements by which the latter are connected, but upon some internal principle

"of its own condition. It will, in the time to come—I know not "when or where—be proved, that the human soul, even in this life, "exists in a state of uninterrupted connection with all the imma- "terial natures of the spiritual world; that it alternately acts on "them and receives impressions from them, of which, as a human "soul, it is not, in the normal state of things, conscious. It would "be a great thing, if some such systematic constitution of the spirit- "ual world, as we conceive it, could be deduced, not exclusively "from our general notion of spiritual nature, which is altogether too "hypothetical, but from some real and universally admitted obser- "vations,—or, for that matter, if it could even be shown to be prob- "able."

What Kant really asserts here is, first, the partly independent and partly dependent existence of the soul, and of spiritual beings generally, on matter, and, second, that spiritual beings have some common connection with and mutually influence one another. This contention, which is that of very many thinkers, does not, however, entail the consequence that the "transcendental subject of Kant" must be four-dimensional, as Zöllner asserts it does. Kant never even hinted at the theory that the psychical features of the world owe their connection with the material features to the fact that they are four-dimensional and, therefore, include the three-dimensional. Is it a necessary conclusion that if a thing exists and is not three-dimensional, as is the case with the soul, that it is therefore four-dimensional? Can it not in fact be so constituted that it is wholly meaningless to speak of dimensions at all in connection with it?

Yet still more strongly than the words of Plato and Kant do certain utterances of the mathematicians Gauss and Riemann speak in favor of Zöllner's hypothesis. S. v. Waltershausen relates of Gauss in his "Gruss zum Gedächtnis," (Leipsic, 1856,) that Gauss had often remarked that the three dimensions of space were only a specific peculiarity of the human mind. We can think ourselves, he said, into beings who are only conscious of two dimensions; similarly, perhaps, beings who are above and outside our world may look down upon us; and there were, he continued, in a jesting tone,

a number of problems which he had here indefinitely laid aside, but hoped to treat in a superior state by superior geometrical methods. Leaving aside this jest, which quite naturally suggested itself, the remarks of Gauss are quite correct. We possess the power to abstract and can think, therefore, what kind of geometry a being that is only acquainted with a two-dimensional world would have; for instance, we can imagine that such a being could not conceive of the possibility of making two triangles coincide which were congruent in the sense above explained, and so on. So, also, we can understand that a being who has control of four dimensions can only conceive of a geometry of four-dimensional space, yet may have the capacity of thinking itself into spaces of other dimensions. But it does not follow from this that a four-dimensional space exists, let alone that it is inhabited by reasonable beings.

Riemann, on the other hand, speaks directly of a world of spirits. In his "Neue mathematische Principien der Naturphilosophie" he puts forth the hypothesis that the space of the world is filled with a material that is constantly pouring into the ponderable atoms, there to disappear from the phenomenal world. In every ponderable atom, he says, at every moment of time, there enters and appears a determinate amount of matter, proportional to the force of gravitation. The ponderable bodies, according to this theory, are the place at which the spiritual world enters and acts on the material world. Riemann's world of spirits, the sole office of which is to explain the phenomenon of gravitation as a force governing matter, is, though, essentially different from the spiritual world of Zöllner, the function of which is to explain supposed supersensuous phenomena which stand in the most glaring contradiction with the established known laws of the material world.

Besides this appeal to the testimony of eminent men like Plato, Kant, Gauss, and Riemann, the scientific prophet of modern spiritualism also bases his theory on the belief, which has obtained at all times and appeared in various forms among all peoples, that there exist in the world forces which at times are competent to evoke phenomena that are exempt from the ordinary laws of nature. We have but to think of the phenomena of table-turning which once ex-

cited the Chinese as much as it has aroused, during the last few decades, the European and American worlds; or of the divining-rod, by whose help our forefathers sought for water, in fact, as we do now in parts of Europe and America.

Cranz, in his essay on the subject, divides spiritualistic phenomena into physical and intellectual. Of the first class he enumerates the following: the moving of chairs and tables; the animation of walking-sticks, slippers, and broomsticks; the miraculous throwing of objects; spirit-rappings (Luther heard a sound in the Wartburg, "as if three score casks were hurled down the stairs"); the ecstatic suspension of persons above the floor; the diminution of the forces of gravity; the ordeals of witches; the fetching of wished-for objects; the declination of the magnetic needle by persons at a distance; the untying of knots in a closed string; insensibility to injury and exemption therefrom when tortured, as in handling red-hot coals, carrying hot irons, etc.; the music of invisible spirits; the materialisations of spirits or of individual parts of spirits (the footprints in the experiments of Slade, photographed by Zöllner); the double appearance of the same person; the penetration of matter (of closed doors, windows, and so forth). As numerous also is the selection presented by Cranz of intellectual phenomena, namely: spirit-writing (Have's instrument for the facilitation of intercourse with spirits), the clairvoyance and divination of somnambulists, of visionary, ecstatic, and hypnotised persons, prompted or controlled by narcotic medicines, by sleeping in temples, by music and dancing, by ascetic modes of life and residence in barren localities, by the exudations of the soil and of water, by the contemplation of jewels, mirrors, and crystal-pure water, and by anointing the finger-nails with consecrated oil. Also the following additional intellectual phenomena are cited: increased eloquence or suddenly acquired power of speaking in foreign languages; spirit-effects at a distance; inability to move, transferences of the will, and so forth.

All these phenomena, presented with the aspect of truth, and associated more or less with trickery, self-deception, and humbug, are adduced by the spiritualists to substantiate the belief in a world of spirits which consciously and purposely take part in the events

of the material world, and that these phenomena may be sufficiently and consistently explained by the effects of the activity of such a world. It is impossible for us to discuss and put to the test here the explanations of all these supersensuous phenomena. Anything and everything can be explained by spirits who act at will upon the world. There are only a few of these phenomena, namely, clairvoyance and Slade's experiments, whose explanations are so intimately connected with our main theme, the so-called fourth dimension, that they cannot be passed over.

First, with respect to clairvoyance, the American visionary Davis describes the experiences which he claims to have made in this condition, induced by "magnetic sleep," as follows:* "The sphere of my vision now began to expand. At first, I could only clearly discern the walls of the house. At the start they seemed to me dark and gloomy; but they soon became brighter and finally transparent. I could now see the objects, the utensils, and the persons in the adjoining house as easily as those in the room in which I sat. But my perceptions extended further still; before my wandering glance, which seemed to control a great semi-circle, the broad surface of the earth, for hundreds of miles about me, grew as transparent as water, and I saw the brains, the entrails, and the entire anatomy of the beasts that wandered about in the forests of the eastern hemisphere, hundreds and thousands of miles from the room in which I sat." The belief in the possibility of such states of clairvoyance is by no means new. Alexander Dumas made use of it, for example, in his "Mémoires d'un médicin," in which Count Balsamo, afterwards called Cagliostro, is said to possess the power of transforming suitable persons into this wonderful condition and thus to find out what other persons at distant places are doing. Zöllner explains clairvoyance by means of the fourth dimension thus:

A man who is accustomed to viewing things on a plain is supposed to ascend to a considerable height in a balloon. He will there enjoy a much more extended prospect than if he had remained on the plain below, and will also be able to signal to greater dis-

* Quoted by Cranz.

tances. The plain, that is, the two-dimensioned space, is accordingly viewed by him from points outside of the plain as "open" in all directions. Exactly so, in Zöllner's theory, must three-dimensioned spaces appear, when viewed from points in four-dimensioned space, namely, as "open"; and the more so in proportion as the point in question is situated at a greater distance from the place of our body, or in proportion as the soul ascends to a greater height in this fourth dimension. Zöllner thus explains clairvoyance as a condition in which the soul has displaced itself out of its three-dimensioned space and reached a point which with respect to this space is four-dimensionally situated and whence it is able to contemplate the three-dimensional world without the interference of intervening obstacles.

The following remark is to be made to this explanation. The reason why we have a better and more extended view from a balloon than from places on the earth is simply this, that between the suspended balloon and the objects seen at a distance nothing intervenes but the air, and air allows the transmission of light, whereas, at the places below on the earth there are all kinds of material things about the observer which prevent the transmission of light and either render difficult or absolutely impossible the sight of things which lie far away. In the same way, also, from a point in four-dimensioned space, a three-dimensional object will be visible only provided there are no obstacles intervening. If, therefore, this awareness of a distant object is a real, actual vision by means of a luminous ray which strikes the eye, there is contained in the explanation of Zöllner the tacit assumption that the medium with which the four-dimensional world is filled is also pervious to light exactly as the atmosphere is.

The theory that there are four-dimensional spirits who produce the phenomena cited by the spiritualists received special support from the experiments which the prestidigitateur Slade, who claimed he was a spiritualistic medium, performed before Zöllner. Of these experiments we will speak of the two most important, the experiment with the glass sphere and the experiment with the knots. To explain the connection of the glass sphere experiment with the fourth

dimension, we must first conceive of two-dimensional reasoning beings, or, let us say, two-dimensional worms, living and moving in a plane. For a creature of this kind it will be self-evident that there are no other paths between two points of its plane than such as lie within the plane. It must, accordingly, be beyond the range of conception of this worm, how any two-dimensional object which lies within a circle in its space can be brought to any other position in its space outside the circle without the object passing through the barriers formed by the circle's circumference. But if this worm could procure the services of a three-dimensional being, the transportation of the object from a position within the circle to any position outside it could be effected by the three-dimensional being simply taking the object *out of* the plane and placing it at the desired point. This object, therefore, would, in an inexplicable manner, suddenly disappear before the eyes of the worms who were assembled as spectators, and after the lapse of an interval of time would again appear outside the circle without having passed at any point through the circle's circumference. If now we add another dimension, we shall derive from this trick, which is wholly removed from the sense-perception of the flattened worms, the following experiment, which is wholly beyond the perception of us human beings. Inside a glass sphere, which is closed all around, a grain of corn is placed; the problem is to transport the corn to some place outside the sphere without passing through the glass surface. Now we should be able to perform this trick if some four-dimensional being would render us the same aid that we before rendered the two-dimensional worm. For the four-dimensional being could take the grain of corn into his four-dimensional space and then replace it in our space in the desired spot outside of the glass sphere. Slade performed this trick before Zöllner. Its mere performance sufficed to convince this latter investigator that Slade had here made use of a four-dimensional agent, who, in respect of power of motion, controlled his four-dimensional space as we do our three-dimensional space. It never occurred to Zöllner that this experiment was the cleverly executed trick of a prestidigitateur, or, as it would at once occur to us, that the whole thing was a sensory illusion. The fact

that we cannot explain a trick easily and naturally does not irrevocably prove that it is accomplished by other means than those which the world of matter presents.

Still better known than this last performance is Slade's experiments with knots. To explain this in connection with the fourth dimension, we must resort again to the plane and the flat worm inhabiting it. To two parallel lines in a plane let the two ends of a third line, which has a double point, that is, intersects itself once, be attached. Our flat worm would not be able to untie the loop formed by the doubled third line, which we will call a string, because it cannot execute motions in three dimensions. If, therefore, a two-dimensional prestidigitateur should appear and accomplish the trick of untying this loop without removing the two ends of the string from the parallel lines, he will have accomplished for our flat worm a supersensuous experiment. A human being engaged in the service of the prestidigitateur could execute for him the experiment by simply lifting the string a little out of the plane, pulling it taut, and placing it back again. This suggests the following analogous experiment for three-dimensional beings. The two ends of a string in which a common knot has been made are sealed to the opposite walls of a room. The problem is to untie this knot without breaking the seals at the two ends of the string. Everybody knows that this problem is not soluble, but it may be calculated mathematically that the knot in the string can be untied as easily by motions in a fourth dimension of space as in the experiment above described the knot in the two-dimensional string was untied by a three-dimensional motion. Now as Slade untied the knot before Zöllner's eyes without apparently making any use of the ends fastened in the walls, Zöllner was still more strongly confirmed in the view that Slade had power over spirits who performed the experiments for him.

Still more far-reaching is the theory of Carl du Prel concerning the relations of the material and the four-dimensional world. (Compare his numerous essays in the spiritualistic magazine *Sphinx*.) Just as the shadows of three-dimensional objects cast on a wall are controlled in their movements by the things whose projections they are, in the same way it is claimed does there exist back of every-

thing of this sense-perceptible world a real transcendental and four-dimensional "thing-in itself" whose projection in the space of experience is what we falsely regard as the independent thing. Thus every man besides existing in his terrestrial self also exists in a spiritual or astral self which constantly accompanies him in his walks through life and whose existence is especially proclaimed in states of profound sleep, of somnambulism, and in the conditions of mediums. In this way Du Prel explains the wonderful feats of somnambulists, and the aerial journeys of sorcerers and witches. Whereas, ordinarily the separation of the material body from the astral body is only effected at the moment of death; in the case of somnambulists this separation may take place at any time, or, as Du Prel says: "the threshold of feeling may be permanently displaced."

In view of the natural relations of such theories to the dogmas of Christianity it is explainable that theologians also have raised their voices for or against spiritualism. While the *Protestant Church Times* beheld in the "repulsive thaumaturgic performances which these coryphæi of modern science offer, a lack of comprehension of real philosophy," the magazine *The Proof of Faith*, expresses its delight at the discovery of spiritualism in the following manner: "Every Christian will surely rejoice at the deep and perhaps mortal wound which these new discoveries have in all probability administered to modern materialism."

We shall pass by the childish opinion that the Bible also speaks of four dimensions, as both in Job (xi, 8–9) and in the Epistle to the Ephesians (iii, 18) only breadth, length, depth, and height, that is, four directions of extension, are mentioned. Yet we will still add, as Çranz has done, the reflections which Zöllner, as the most prominent representative of modern spiritualism, has put forward respecting its relation to the doctrines of Christianity (*Wissensch. Abhandl.*, Vol. III). By the foundation of transcendental physics on the basis of spiritualistic phenomena, the "new light" has arisen which is spoken of in the New Testament. The rending of the veil of the Temple on the crucifixion of Christ, the resurrection, the ascension, the transfiguration, the speaking with many tongues on the giving out of the Holy Ghost, all these are in Zöllner's view spiritualistic

phenomena. Similarly, he sees a reference to the four-dimensional world of spirits in all those sayings of Christ in which the latter speaks to his Apostles of the impossibility of their having any image or notion of the place to which when he disappeared he would go and whence he would return. (Gospel of St. John, xiii, 33, 36; xiv, 2, 3, 28; xvi, 5, 13).

Ulrici, however, goes furthest in the mingling of spiritualistic and Christian beliefs; for he sees in the doctrine of spiritualism a means of strengthening belief in a supreme moral world-order and in the immortality of the soul. In answer to Ulrici's tract "Spiritualism So-called, a Question of Science" (1889) Wundt wrote an annihilating reply bearing the title "Spiritualism, a Question of Science So-called." Wundt criticises the future condition of our souls according to spiritualistic hypotheses in the following sarcastic yet pertinent words, which Cranz also quotes: "(1) Physically, the "souls of the dead come into the thraldom of certain living beings "who are called mediums. These mediums are, for the present, at "least, a not widely diffused class and they appear to be almost ex- "clusively Americans. At the command of these mediums, departed "souls perform mechanical feats which possess throughout the char- "acter of absolute aimlessness. They rap, they lift tables and chairs, "they move beds, they play on the harmonica, and do other similar "things. (2) Intellectually, the souls of the dead enter a condition "which, if we are to judge from the productions which they deposit "on the slates of the mediums, must be termed a very lamentable "one. These slate-writings belong throughout in the category of "imbecility; they are totally bereft of any contents. (3) The most "favored, apparently, is the moral condition of the soul. According "to the testimony which we have, its character cannot be said to be "anything else than that of utter harmlessness. From brutal per- "formances, such, for instance, as the destruction of bed-canopies, "the spirits most politely refrain." Wundt then laments the demoralising effect which spiritualism exercises on people who have hitherto devoted their powers to some serious pursuit or even to the service of science. In fact it is a presumptuous and flagrant procedure to forsake the path of exact research, which slow as it is,

yet always leads to a sure extension of knowledge, in the hope that some aimless, foolhardy venture into the realm of uncertainty will carry us further than the path of slow toil, and that we can ever thus easily lift the veil which hides from man the problems of the world that are yet unsolved.

* * *

Now that we have presented the opinions of others respecting the existence of a four-dimensional world of spirits, the author would like to develop one or two ideas of his own on the subject. In the preceding section it was stated that everything that we perceive by our senses is three-dimensional and that everything that possesses four or more dimensions can only be regarded as abstractions or fictions which our reason forms in its constant efforts after an extension and generalisation of knowledge. To speak of a two-dimensional matter is as self-contradictory as the notion of four-dimensional matter. But a two or a four-dimensional world might exist in some other manner than a material manner, and for all we know in one which to us does not admit of representation. But in such a case, if it were without the power of affecting the material world, we should never be able to acquire any knowledge concerning its existence, and it would be totally indifferent to the people of the three-dimensional world, whether such a world existed or not. Just as an artist during his lifetime produces a number of different works of art, so also the Creator might have created a number of different-dimensioned worlds which in no wise interfere with one another. In such a case, any one world would not be able to know anything of any other, and we must consequently regard the question whether a four-dimensional world exists which is incapable of affecting ours, as insoluble. We have only to examine, therefore, the question whether the phenomenal world perhaps is a single individual in a great layer of worlds of which every successive one has one more dimension than the preceding and which are so connected with one another that each successive world contains and includes the preceding world, and, therefore, can produce effects in it. For our reason, which draws its inferences from the phenomena of this world, tells us, that if outside the three-dimensional world there exists a

second four-dimensional world, containing ours, there is no reason why worlds of more or less dimensions should not, with the same right, also exist. But if now, as Zöllner and his adherents maintain, four-dimensional spirits exist which can act by the mere efforts of their own wills on our world, there is surely no reason why we three-dimensional beings should not also be able to produce effects on some two-dimensional animated world. Whether we have, generally, any such influence we do not know, but we certainly do know that we do not act purposely and consciously on a two-dimensional world. If, therefore, Zöllner were right, the plan of creation would possess the wonderful feature that four-dimensional beings are capable of arbitrarily affecting the three-dimensional world, but that three-dimensional beings have no right in their turn consciously to affect a two-dimensional world.

The supporters of Zöllner's hypothesis will perhaps reply to the objection just made, that the plan of creation might, after all, possibly possess this wonderful peculiarity, that we human beings perhaps, in some higher condition of culture, will be able to act consciously on two-dimensional worlds, and that at any rate it is simply an inference by analogy to conclude from the non-existence of a relation between three and two dimensions that the same relation is also wanting in the case of four and three dimensions. As a matter of fact, the objection above made is not intended to refute Zöllner's hypothesis, but only to stamp it as very improbable. But despite this improbability Zöllner would still be right if the phenomena of the material world actually made his hypothesis necessary. That, however, is by no means the case. Although most of the phenomena to which the spiritualists appeal are probably founded on sense-illusions, humbug, and self-deception, it cannot be denied that there possibly do exist phenomena which cannot be brought into harmony with the natural laws now known. There always have been mysterious phenomena, and there always will be. Yet, as we have often seen that the progress of science has again and again revealed as natural what former generations held to be supernatural, it is certainly wholly wrong to bring in for the explanation of phenomena which now seem mysterious an hypothesis like that of Zöllner's, by which

everything in the world can be explained. If we adopt a point of view which regards it as natural for spirits arbitrarily to interfere in the workings of the world, all scientific investigation will cease, for we could never more trust or rely upon any chemical or physical experiment, or any botanical or zoölogical culture. If the spirits are the authors of the phenomena that are mysterious to us, why should they also not have control of the phenomena which are not mysterious? The existence of mysterious phenomena justifies in no manner or form the assumption that spirits exist which produce them. Would it not be much simpler, if we *must* have supernatural influences, to adopt the naïve religious point of view, according to which everything that happens is traceable to the direct, actual, and personal interference of a single being which we call God? Things which formerly stood beyond the sphere of our knowledge and were regarded as marvellous events, as a storm, for example, now stand in the most intimate connection with known natural laws. Things that formerly were mysterious are so no longer. If one hundred and fifty years ago some scientists were in the possession of our present knowledge of inductional electricity and had connected Paris and Berlin with a wire by whose aid one could clearly interpret in Berlin what another person had at that very moment said in Paris, people would have regarded this phenomenon as supernatural and assumed that the originator of this long-distance speaking was in league with spirits.

We recognise, thus, that the things which are termed supernatural depend to a great extent on the stage of culture which humanity has reached. Things which now appear to us mysterious, may, in a very few decades, be recognised as quite natural. This knowledge, however, is not to be obtained by the lazy assumption of bands of spirits as the authors of mysterious phenomena, but by performing what in physics and chemistry is called experiment. But the first and essential condition of all scientific experimenting is that the experimenter shall be absolutely master of the conditions under which the experiment is or is not to succeed. Now, this criterion of scientific experimenting is totally lacking in all spiritualistic experiments. We can never assign in their case the conditions un-

der which they will or will not succeed. When all the preparations in a spiritualistic séance have been properly made, but nothing takes place, the beautiful excuse is always forthcoming that the "spirits were not willing," that there were "too many incredulous persons present," and so forth. Fortunately, in physical experiments these pretexts are not necessary. By the path of experiment, and not by that of transcendental speculation, physics has thus made incredible progress and has piled new knowledge strata on strata upon the old. Accordingly, the prospect is left that the mysteries which the conditions and properties of the human soul still present can be solved more and more by the methods of scientific experiment. To this end, however, it is especially necessary that the physio-psychological experiments in question should only be performed by men who possess the critical eye of inquiry, who are free from the dangers of self-illusion, and who are competent to keep apart from their experiments all superstition and deception. The history of natural science clearly teaches that it is only by this road that man can arrive at certain and well-established knowledge. If, therefore, there really is behind such phenomena as mind-reading, telepathy, and similar psychical phenomena something besides humbug and self-illusion, what we have to do is to study privately and carefully by serious experiments the success or non-success of such phenomena, and not allow ourselves to be influenced by the public and dramatic performances of psychical artists, like Cumberland and his ilk.

The high eminence on which the knowledge and civilisation of humanity now stands was not reached by the thoughtless employment of fanciful ideas, nor by recourse to four-dimensional worlds, but by hard, serious labor and slow, unceasing research. Let all men of science, therefore, band themselves together and oppose a solid front to methods that explain everything that is now mysterious to us by the interference of independent spirits. For these methods, owing to the fact that they can explain everything, explain nothing, and thus oppose dangerous obstacles to the progress of real research, to which we owe the beautiful temple of modern knowledge.

HERMANN SCHUBERT.

CORRESPONDENCE.

I.

THE RELIGIOUS OUTLOOK IN FRANCE.

THE return of Mme. Hyacinthe Loyson to France after her American tour, undertaken, I understand, in order to obtain new support for the Gallican church, suggests the writing of this article, which will be a brief survey, from the point of view of an American layman, of the present religious situation in France.

As Père Hyacinthe's reform has been made the peg on which to hang this article, perhaps I cannot do better than begin by an examination of the noble but fruitless labors of the eloquent ex-Carmelite. While one cannot help being carried away by the oratory of Hyacinthe Loyson and charmed with his personality, so full of wit, kindliness, and gentility; while one must admire the devotedness and earnestness of Mme. Loyson and feel much sympathy for their studious and promising son Paul, one is convinced in spite of one's self that this latter-day Gallicanism is doomed to failure if indeed it has not already failed. You have simply to visit the poor little church in the Rue d'Arras, in this city, to see what a mere handful of followers Père Hyacinthe has been able to collect in this great centre of two million people, after years of work and after preaching hundreds of magnificent sermons that would fill to overflowing the largest edifice in America, Sunday after Sunday, if delivered with similar eloquence by a divine of no matter what denomination or of no denomination at all. To the practical layman of this practical age no further demonstration is necessary in order to prove that Père Hyacinthe's mission is, as the French say, *un coup*

dans l'eau, that is, an effort which produces no result. Whenever I leave this humble church and am well out in the narrow, shabby street in which it is situated and am away from the influence of the preacher's fascination, I cannot help exclaiming, What a waste of power, What a casting of pearls before swine! And all of Mme. Loyson's enthusiastic conversation in private, her accounts of the encouraging letters received by the Père, furtively of course, from discontented priests, and her statements concerning the warm words of sympathy and support from the churchmen of foreign lands, cannot remove that abiding feeling that this rejuvenated Gallican church movement is other than a dismal failure; more than ever one exclaims: *C'est un coup dans l'eau.*

Père Hyacinthe has always received, in France as abroad, his greatest support from the Protestants. But Protestantism here in France is a sickly growth when compared, for instance, with its rich and sturdy brother in the United States. It has, at most, only a small band of followers, nearly lost to view in the vast army of Catholicism and Freethought. Furthermore, the Liberal wing is losing ground and the Orthodox wing gaining slightly, not an encouraging sign in these days to those who hope for the final triumph of faith over the growing tendency towards infidelity. The real truth is that about the only strength left in French Protestantism to-day lies in the fact that there is a certain *éclat* associated, in the eyes of the upper classes, with the being a Protestant, much as is the case in America and England, in the same rank, about being a Roman Catholic. It distinguishes you from the multitude, and in these democratic times human nature, especially when it is that of the "upper ten," is very keen for elimination from "the vulgar throng." It is difficult for an American to comprehend this peculiar little streak of innocent vanity running through certain French circles which shows itself in this wish to be known as Protestants. It is not too much to say that to the impartial outside observer this phase of the French Protestantism of to-day is the one that first strikes the eye; which goes to prove in a peculiar but significant manner the weak hold, on the one hand, which the doctrine of Luther and Calvin now has on the French nation, and, on the other hand, how uni-

versal must be scepticism, freethought, and utter indifference to church and religion of every kind.

If native French Protestantism exerts so little influence on the nation, it is easy to imagine the excessive futility of the work of the foreign missionary. There is a great deal said in American and religious circles about the labors in France of the Salvation Army, the McAll Mission, the Young Men's Christian Association, etc. I have received more than one letter from would-be subscribers in the United States asking me if these and other similar organisations were really accomplishing all that they pretend. My reply is invariably that if you regard their labors as charity work some good is being done, but if money is asked for because of the religious results which have been accomplished, the demand should be considered to be arrant humbug. If Père Hyacinthe, a Frenchman and a Catholic, after forty years of labor, has accomplished next to nothing, it is easy to imagine how this nation, so reserved in its relations with the foreigner when he attempts to penetrate into its inner life, would treat Scotch and Yankee missionaries. From a religious standpoint, therefore, American money and sympathy is absolutely thrown away when it is sent to France. If it be answered that much misery and physical suffering is relieved by these foreign missions, the French might well ask if charity does not begin at home. The French are a peculiarly thrifty people. Few are poor, beggars are scarce and charitable institutions are rich and numerous. Hence devoting American dollars to the relief of French distress is much like sending coals to Newcastle, if it is not a piece of sheer impertinence, like our protesting to the Czar against his Siberian convict system when we have one quite as cruel in full swing in some of our Southern states.

And now, finally, a few paragraphs about the great Roman Catholic church of France, the only religious institution of any real first-rate importance in this country.

While it is true that the Catholic Church, at least as a church, still has a strong hold on the French nation, it is also quite true that indifference, infidelity, free thought, and atheism are on the increase. Matthew Arnold says, in his essay on Tolstoi, written in

1887: "Between the age of twenty and that of thirty-five he [Tolstoi] had lost, he tells us, the Christian belief in which he had been brought up, a loss of which examples nowadays abound certainly everywhere, but which in Russia, as in France, is among all young men of the upper and cultivated classes more a matter of course, perhaps, more universal, more avowed, than it is with us." Arnold might have enlarged, at least in the case of France, his limits and stated that in the cities the middle and lower classes, too, particularly the male portion, have abandoned Rome. One has only to visit a Paris church to be convinced of the contempt which men feel for the priesthood and religion: you can count ten female devotees for one of the masculine gender. In the village church, far away from the great centres, the priest may still have the large majority of the population, men and women alike, as faithful attendants upon service. But even here, for one man who confesses, a dozen or score of women will kneel at the chair. Then again, this more general participation in religious ceremonies by the rural population is due in a large measure to the fact that these Sunday masses and vespers are almost the only break and variety in a very dead and monotonous existence. The church is a sort of meeting place, where whole families, babies, children, and adults, congregate. The hum of idle conversation, the crying of infants, and the ardent exhortations of the priest are often mingled in a manner that would astonish and shock a pious Protestant, accustomed to the highly proper atmosphere of an Episcopalian or Presbyterian Church in the United States.

Another sign of the disfavor in which French Catholicism finds itself to-day is seen in the quality of its future priests. You have simply to look into the faces of the seminarists as they pass by you in procession in the streets of Paris to be convinced of the well-known fact that these young men are, for the most part, the faint-hearted and dull-headed sons of the peasantry, eager to escape the drudgery of farm life and not intelligent enough for business or the petty employments offered by the State.

"Anybody can make a priest," is often heard in France. The result is that just as the English army is the receptacle for the riff-

raff—the Tommy Atkinses of Rudyard Kipling's "Barrack-room Ballads"—of the cities, so the French priesthood draws most of its recruits from the scum of the farming districts. This fact contrasts strongly, by the way, with the manner in which the Protestants fill their pulpits. The young man who becomes a pastor is not looked upon by his friends and companions as a failure and a numskull. Quite the contrary; he is immediately classed among those taking a high moral stand. Some of the best families of France are descended from, or have relatives who are, clergymen, and they are quite proud of the fact; another example of that sentiment of halo surrounding French Protestantism to which reference has already been made.

Another cause of this boycotting of the cloth as a profession by the youth of the élite is due to the Church having got on the wrong side during the struggle for the foundation of the present Republic. The Catholics supported the Monarchists and Bonapartists and took an active part in the attempt to prevent the advent of republican institutions and to overthrow these institutions when they had been accepted by a majority of the nation. This unpatriotic course brought the Church into bad odor among republicans, so that the having a son in orders, for example, would be apt to be an impediment to a father aspiring to political preferment, especially if the latter belonged to the Radical or Socialist wing of the Republican army. The result is that a whole great political party is, in its general tendency, opposed to the Catholic Church.

Nor is the harm occasioned thereby limited to lowering the quality of the seminarists. It makes a vast number of intelligent and influential citizens sworn enemies of religion. Thus, when Gambetta attended funerals, he would not enter the church, but wait outside in the porch. When Louis Blanc was buried neither church nor priest participated in the pageant. On the death of Henri Martin, a free-thinking Protestant clergyman officiated at the burial service. Hundreds of other prominent Republicans, who have died or been buried since 1870, never entered a church, perhaps, except when their bodies were borne there by their families,

acting under the influence of its female members, or out of respect for public sentiment.

One of the shrewdest acts of Leo XIII. is his recent declaration in favor of the French Republic. He not only accepts the situation, but has ordered the faithful, both ecclesiastical and lay, in France to do likewise. But this demand has not been complied with without a murmur. More than one priest and noble has shown himself more ultramontane than the Pope. The important fact remains true, however, that officially the Vatican recognises the political change in France, and, though the Republicans, particularly those of the Radical camp, are wary of these new converts and still believe with Gambetta, that "*le clericalisme, voilà l'ennemi,*" yet the mere fact that the Vatican lays down its arms means a great deal, even if the hatchet may not be definitively buried. Moderate Republicans, those who go to church even if they do not believe what is said there, think they see in this action of the Holy Father a new source of strength for the Republic. And it seems to me that they are right, and that this view is the soundest. If the priesthood ceases its attacks on the political powers that be, and if these latter keep a sharp watch, which will be done while the Radical and Socialist elements are so strong in Chamber and Senate, the clerical party can be held in check, and the Republic will have so many less enemies, even if these quondam enemies are but lukewarm friends.

THEODORE STANTON.

II.

NEW FRENCH BOOKS.

I am happy to have the opportunity in my present letter to speak of a book of real importance, *La pathologie des emotions, Études physiologiques et cliniques*, by M. Ch. Féré. The name of this learned physician of the Bicêtre is sufficiently well known to dispense me from the necessity of speaking of his personality, so that I can devote all that I have to say to his work. Its great merit is not so much the novelty of the psychological theory which is laid at its foundation, as the wealth of facts presented and the sureness of the methods pursued. M: Féré's mind is of a distinctly positive cast, and he possesses in a high degree the ability to draw from the thesis which he illustrates and confirms, the various consequences which from a medical and social point of view this thesis involves.

States of intellectual consciousness, he writes, citing Spencer, cannot be dissociated from emotional states. The emotions are the products of our mental representations of agreeable states or painful states, and are the stronger according as they contain a greater number of present or nascent sensations competent to recall these states. The emotions, accordingly, being simply representations of states of consciousness provoked by external excitations, it is to be presumed that the physiological conditions of emotions (of central or cerebral origin) present a striking analogy, if not an absolute resemblance, to the physiological conditions of sensations (of peripheral origin, either internal or external); and this relation should be as prominently marked in pathological as in normal states. The upshot of all this is, continues M. Féré, that physical agents capable of modifying a state of consciousness of peripheral origin (sensations), are also capable of modifying states of consciousness of central origin (emotions). "The external signs of these different states of consciousness can be studied by the same methods. Psychology is only specialised physiology; mental medicine only a specialisation of general medicine, from which it must borrow its methods of re-

search and action—all purely physical. The demonstration of these relations is the object of the present work."

The work, which contains almost six hundred pages, presents no divisions but that of chapters. But it would not be difficult to group its contents under the four general titles: (1) physiological and pathological effects of physical agents on man; (2) physiological conditions and pathological and curative effects of emotions; (3) psychopathy and morbid emotivity; (4) the consequences to individuals and society of morbid emotivity, its medical treatment, prophylaxis and legislation. The entire demonstration of M. Féré, I might add, is essentially aimed at the two following propositions: the first, that all the symptoms of emotions possess a certain resemblance to those of fatigue or physical pain; the other, that the original source of morbid emotivities and their resultant disorders is a state of depression congenital or acquired.

M. Féré reverts constantly to these fundamental ideas. After having exhibited, for example, the reciprocal influences of the emotions, or disorders of the imagination, and of disorders which are of physical origin, he concludes that "physical disease and moral disease have the same basis." It is thus only in appearance, he writes, that the mind has any influence on the functions of the body; the phenomena of mind are, quite the reverse, the necessary effect of certain modifications of the body, and it is by the intermediary action of the manifestations of the body that the representations of the mind act. It is found convenient to regard the gray matter of the brain as the central organ of the emotions, and the great sympathetic as the peripheral organ that presides over their "exteriorisation"; but we have no right to think of the emotions without their external signs, and we are thus led to the conclusion that "emotion is essentially a generalised reflex phenomenon the centrifugal path of which is principally the great sympathetic system."

A psychological question much debated since M. Ribot took it up, the question of *attention*, is also treated here, in an incidental yet very interesting manner (Chapter III). M. Féré connects attention with the study of the physiological conditions of physical action, and thus takes sides, it will be seen, with the motory theory

of attention. James Sully, and others, have denied the existence of muscular phenomena accompanying attention. But physiology is in a position to disclose the existence of these movements; it can study their qualities, their energy, their form, their precision, and their rapidity. We will find in M. Féré's book a number of new experimental facts establishing the thesis that "muscular tension constitutes the physiological condition of attention." "The mistake of many psychologists (M. Hirth, for example) has been, that they have confounded rest with willed immobility, which from a mechanical point of view is very far removed from the former; for immobility of will is precisely the result of very intense muscular activities, and can only be produced by a general tension of the muscular system, which throws the subject in a state such that it can react the most quickly and most energetically on any excitation, whencesoever it may proceed." Willed, or voluntary, immobility is attention itself; to produce this state, well-enervated and well-nourished muscles are necessary. "We may say," declares M. Féré, "that the practice of immobility is the most favorable exercise for the development of the mind: a system of education which should neglect this exercise would suppress attention, it would be a regressive education."

"It is lack of attention," he tells us further on, "that is the cause of the insensibility of hysterical patients, and it is instability of attention that is the cause of the variability of their sensory and motory disorders." It is all due to the want of sufficient energy to bring simultaneously into a state of tension the muscular settings of all of the sensory organs. Hysterical anæsthesia according to him —and how perfectly right he is!—is nothing but a mental and psychical disease, which may be cured by *suggestion*; it is an organic malady, which cannot be cured without the restoration of the proper organic state.

Worthy of notice are a few pages on the existence of electrical phenomena, "which are exaggerated in certain subjects, but which appear to exist in a more feeble degree in the normal states." The facts here involved might furnish us with a key to the phenomena of transmission, polarisation, elective sensibility, and certain actions

at a distance, whose solution still presents great difficulties. Also to be noted are a number of corrections of inductions made by Darwin, whom ignorance of physiology often involved in mistakes concerning the true nature of phenomena: thus Darwin was often led to attribute an intentional character to actions which are throughout reflex.

Basing his views on the inevitable correlation of these two orders of phenomena, the physical and the psychical, M. Féré stands in a position of direct hostility to the metaphysics (of course, unconscious) of the great body of alienists. He selects the characteristic disorder of insanity, namely hallucination, and sets about to show the existence of physical phenomena concomitant with hallucination. Chapter XIII is one of the most instructive of his work and well worth thoughtful perusal. Let us add on this point that M. Féré stoutly combats the doctrine, held by Magnan in particular, that all forms of phobia, that is to say, of morbid emotive states, are the brands of degeneration. He admits, however, that a great number are connected with permanent constitutional states, congenital or acquired.

M. Féré accepts the pathological and degenerative theory of crime. But he rejects in a measure Lombroso's thesis of the assimilation of genius to insanity. Genius and talent, he says, are by no means devoid of intellectual and emotional anomalies, but it is not true that neuropathic states are the indispensable concomitants of genius, although susceptibility to impressions is, when not developed to excess, one of the physiological conditions of genius.

With respect to the social consequences involved, I will simply quote his concise statement that "physiology is quite in accord with political economy in condemning the intemperate generosity which favors the development and multiplication of emotive personalities." With regard, finally, to the question of responsibility, M. Féré's position differs, so far as I can see, in no respect from my own, which I have expounded at sufficient length in a former number of *The Monist*, to dispense me from the necessity of reverting to it here.

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Our next book is also a remarkable one—*Les transformations du droit*, by M. G. TARDE, a small volume of some two hundred and

twelve pages. M. Tarde has again and again declared himself the avowed adversary of Spencerianism, and of evolution generally, at least in so far as the idea of evolution is indiscriminately and unreflectingly employed, as is the case, he maintains, in a great class of social questions which make up the criminal and civil law. Everywhere in these domains, despite apparent uniformity, which is the simple effect of a perspective that effaces the differences of remote times, is found diversity. The serial stages of development professedly disclosed, he rejects as absolutely incompetent in the explanation of criminal law, procedure, the status of persons and things, and obligations.

In criminal law, for example, we ordinarily regard the system of pecuniary composition as the origin of penal justice, and the idea of vengeance as necessarily antecedent to the idea of culpability. A mistake, says M. Tarde. And he offers on this subject a distinction which is quite curious. He sees the defensive reaction made against criminal acts originally splitting up into two distinct forms of quite unequal scope: the one moral, the joint product of indignation and compassion; the other vindictive, malevolent, and ruthless. The first, according to him, is exercised within the family and between members of the same social group; the second is displayed towards the foreigner and the enemy. Of these two sources of penality, the domestic moral punishment is the most important; the blow-for-blow policy, or vengeance, although more apparent, is a secondary source. I fully admit that the instinct of sympathy, the primitive condition of all social aggregation, has never been wholly absent from human relations, and it might be that the distinction perceived by M. Tarde is well founded, although the two sources appear to have become so confounded in the justice of the tribunals that it is difficult to trace them to that point. But M. Tarde seems to me to be too much disposed to flatter the portrait of the primitive man and to make as "mild as lambs" these prehistoric creatures whom we have pictured as "cruel as tigers," and to be too much preoccupied with the ideas of penality and moral responsibility, which he thinks the new theories have compromised.

With respect to the status of persons, he denies the existence of

the well-known order of development by which promiscuity, matriarchy, and patriarchy are said to succeed each other. The tribe could only have arisen, he tells us, from the federation of families, and the strong family, the one capable of development, could only have been patriarchal. It is wrong, he adds, to regard uterine filiation, that is, the custom of considering a child the son of its mother and not the son of its father, as a vestige of a pre-existent matriarchy. "In a patriarchal society, polygamy—which is the very reverse of matriarchy—ought in the very necessity of things to give predominance to the custom referred to, so that children born of the same mother could be distinguished from one another." This, indeed, was the idea of the Greek tragedians. The maxim, which occurs so often in Euripides, that it is not good that a man should have several wives, is always disclosed as the anxiety of assuring the legitimacy of children; Æschylus charges Minerva to defend the "cause of her father"; it is one of the aspects of the reaction against the customs of Asia. The primitive family, says M. Tarde, in summing up, was quite different in its original forms; it was here monogamic, there polygamic, and in other places polyandrous, at one time exogamic and at another endogamic, and so forth. "Marriage, therefore, did not spring from a single typical form, nor does it, in its various forms, make towards such."

His criticisms are of equal strength with regard to the status of things and the presumed priority of collective property. Contrary to the views of M. de Laveleye, he is of opinion that the community of the village could only have arisen on an enlarged model of the community of the family, "just as the vestal fire of the city could only have been lighted in imitation of the fire of the domestic hearth": The certain effect of the first must in its origin have been to encroach upon, not to produce, the second. Excessively preoccupied in finding in the present the vestiges of a state of things that is past, the evolutionists involve themselves, regardless of consequences, in many naïve and wonderful theories, which M. Tarde, in his keen and pointed style, has not hesitated to expose. There is much point and a profusion of the *granum salis* in these instructive pages.

With respect to obligations, he makes a distinction, as in crim-

inal law, between internal and external relations. Also, after having asserted with Sir Henry Sumner Maine, the non-fusion of the law of nature and the law of nations, he remarks that here also there exists two sources whose waters have not subsequently flowed together: the *jus naturæ* is conceived to be the generalisation of a type of relations abstracted from the internal relations of the members of the primitive social group; the *jus gentium* to be the outcome of relations between men that belong to different groups.

Is, then, this disordered succession of the social data mere chance? The reader will bethink himself of a number of facts which go to disprove this conclusion, and it is a difficulty moreover which M. Tarde has also felt. He replies by making a distinction of "two kinds of laws, the laws of causation and the supposed laws of evolution." The first, which in his theory are analogous to the laws of celestial mechanics, whose formulæ remain constant no matter what the history of the solar systems distributed throughout the heavens may be, are the psychological laws; the second are merely arbitrary formulæ, which, when we come to define them accurately, do not admit of adaptation even to the majority of cases. The psychological laws of which M. Tarde here speaks are reducible to *imitation** —consequently to *invention*—and to *logic*. I certainly do not propose to question the importance of these factors. In a short tract published several years ago I pointed out myself that the influences of contact are more efficient than the influences of race or even of climate, and this implicitly involves the idea of imitation. Yet the character of the psychological factor does not, it seems to me, exclude a tendency towards a certain arrangement of the data of society, despite their possible and actual diversity. "With respect to the facts of society," I wrote, "we point out their changes but do not succeed in disclosing the laws of their evolution; the most we have done is to note amid the totality certain features which appear to predominate." To extricate these features is a task not unworthy of the historian. M. Tarde himself admits that results of this character have already been reached, and he especially points

* See his work *Les lois de l'imitation* (Alcan, Paris).

to "the splendid and commendable movement in advance, which though not generally noticed* has, nevertheless, accompanied all juridical evolutions"—namely, the constant enlargement of the relations of law as the result of a growing sympathy and sociability.

To sum up, the point of view which M. Tarde has taken does not exclude a class of researches different from his. Nothing can be better than to formulate the laws of the psychological agent, and M. Tarde, original mind that he is, has done this with a superiority and penetration to which I yield my unqualified admiration. At bottom, does not the view of Auguste Comte, despite his contempt for psychology, involve the preliminary study of the biological individual and the social agent? Psychological laws and physical laws undoubtedly meet in the same group of "laws of causation"; still, it should not be forgotten that in the social order of things man is the creator of the facts and that his creations react upon him in the proportion in which they are realised. At any rate, a tangible relation exists between the creations of the agent and the variations of the results, and it is not forbidden to inquire if there does not also exist a certain order in these creations, the effect of which would be to produce a recognisable serial succession in the results, a medial line about which the events of our life oscillate. A difficult investigation—and one in which M. Tarde has shown himself to be too speedily satisfied, and in which we should strenuously guard against hasty generalisations. It is unpleasant, we admit, to turn topsy-turvy a house in which we have long lived in comfort; but our contentment returns in an increased measure when we have replaced our things in their proper places, and swept out the dusty corners.

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M. M. AGUILÉRA has just published a work entitled, *L'idée du Droit en Allemagne*. His book is a history of the different schools

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* I have called attention to this in a less definite manner in several passages of my book *La morale dans le drame, l'épopée et le roman*, in which I shall have to incorporate the corrections which the splendid studies of M. Tarde have suggested. For the citation given a few lines above I ask permission to refer the reader to my *Journal d'un philosophe* (Alcan, Paris).

of law which have arisen in Germany and lays especial emphasis on the fact that no nation has advanced as far as this in seeking in philosophical ideas the motives and the justification of its acts, and he sets about showing how the existence of Germany's special conception of law may be explained. Germany, he writes in his conclusion, everywhere starts from the idea of force. Its peculiar characteristic is to bow before victorious force. And to this must be added, if we wish to comprehend its aggressive character, the sentiment of vanity, which has led it to proclaim "that incredible formula: the ideal of Germany is the ideal of humanity."

M. GEORGE LYON gives us a learned historical study, *La philosophie de Hobbes*. He points out how everything is interrelated in the work of this philosopher—his conception of the state to his theories of ethics, his ethical doctrines to his psychological theories, and the latter to general principles concerning nature, thought, and their laws. But he also presents with much force the objections to Hobbism. He condems its final consequence, which is submission to force. He points out finally the inevitable ambiguity which permeates this system in consequence of the struggle "between individual inspiration, which is purely ontological, and the action of an intellectual environment which is eminently empirical. Hobbes was "the metaphysician of empiricism as Bacon was its poet." I dismiss for the present all discussion of these subjects; an occasion will present itself later of dealing with them.

In *Les races et les langues* M. ANDRÉ LEFÈVRE sums up the state of the science of language. The distinguishing characteristic of his work is the non-separation of language from the organism which has produced it, and the simultaneous presentation of languages with the ethnical groups which speak them. M. Lefèvre accepts, let us note at once, the well-known stages of the linguistic school—monosyllabism, agglutination, inflection, and analysis, which M. Tarde, if he should unexpectedly become a philologist would stigmatise as gratuitous. Of the races, of the places of origin, and of the migrations of the ancient peoples he tells a great many stories which are somewhat of the fairy-tale order, but this reservation does not affect in the least the value of his special linguistic researches.

In conclusion I shall mention *Le problème de la mort, ses solutions imaginaires et la science positive*, by M. L. BOURDEAU, and *Platon, sa philosophie, précédé d'un aperçu de sa vie et de ses écrits*, by M. CH. BÉNARD, a new volume in the series of historical studies by this venerable professor.*

LUCIEN ARRÉAT.

* All the works mentioned are published by F. Alcan.

BOOK REVIEWS.

EINLEITUNG IN DIE PHILOSOPHIE. By *Prof. Friedrich Paulsen.* Berlin: Wilhelm Hertz. 1892.

Friedrich Paulsen, professor at the University of Berlin, writes this "Introduction" not so much for connoisseurs as for students, whom it may serve as a guide. He discusses in general outlines the various fundamental problems of philosophy, at the same time indicating his own position, which, in more than one respect, is very similar to the philosophy presented in the columns of *The Monist.*

His own view, which, as he trusts, is the general tendency of modern philosophical thought, he calls "idealistic monism." It is opposed, on the one hand, to supernatural dualism, and on the other hand to atomistic materialism; the former being the traditional doctrine of the schoolmen and of ecclesiasticism, separating body and soul, nature and God, etc., each into two distinct realities, which are accidentally combined, the latter being an attempt, having its beginning in the eighteenth century, to explain all natural phenomena in a purely mechanical way. Paulsen adds: "The whole history of modern philosophy can be said to be a con-"tinuous attempt to overcome this opposition. . . . The principle of natural science "is the *Natur-Gesetzmässigkeit* of all events. . . . Modern materialism derives from "this a kind of metaphysics, represents all reality as a system of blindly operating "physical forces. . . . Philosophy undertakes to dispel the opposition of these two "doctrines; its proposition is—and we may say that this is the main-spring of the "entire evolution of modern philosophy—*to reconcile the religious world-conception "with that of natural science.* There are many who regard this aspiration as a sort "of squaring of the circle, and we grant that some similitude between the two may "exist, for here as well as there we can attain only to approximations, here as well "as there we can never solve the problem finally and forever. At any rate, we "must recognise the fact that the whole philosophical thought of the last three "centuries has been directed towards this goal."

Professor Paulsen classes the various philosophies of the present time as follows: (1) The phenomenalistic-positivistic philosophy which denies any absolute cognition of reality, least of all in physics; the world of objects is a world of phenomena. (2) The idealistic monistic philosophy. To define the nature of reality

as it is in itself, we must rely upon the data of our inner experience. The intellectual-historical world is to us the most comprehensible dénouement of reality—in fact, the only comprehensible one. The ultimate idea to which we are led in tracing out facts, is this: Reality, which presents itself to our senses in the objective world as a unitary system of motions, is the appearance of a spiritual all-being, which must be conceived as the evolution of some unitary idea. In this respect idealistic monism agrees upon the whole with speculative philosophy, or rather with all idealism since Plato.

The philosophy of the present time is, further on, characterised (3) as passing from intellectualism to voluntaryism; namely, it allows the will to have its legitimate influence in the construction of a world-view. It is (4) evolutionistic-theological, which latter tendency meets half way the above-mentioned idealistic monism. Both are beginning to permeate ethics, sociology, jurisprudence, and politics. The old formalistic methods are dropped and teleological considerations prevail. Purpose is recognised to rule in life. Lastly (5) the philosophy of to-day is historical. The older philosophy is mathematical-naturalistic or abstract-rationalistic. Speculative philosophy precedes the construction of an intellectual-historical world; it then attempts also to construct nature historically, at least in a logico-genetic schematism. Natural science has already pursued this course in its cosmical and biological theories of evolution. It is apparent how these tendencies follow the old tradition of harmonising the physical and the intellectual-historical worlds into one unitary conception of the whole.

The book is divided into two parts, with an introduction and conclusion. The introduction defines the relation of philosophy to mythology and to the sciences. Philosophy cannot be separated from the sciences. Says Paulsen: "Figuratively "speaking, reality is a great riddle proposed to man; all the various sciences de- "termine some parts of it, and the attempt to solve the *whole*, to find the key to "the *mysterium magnum* of being, is called philosophy."

The first book treats, in two chapters, of the problems of metaphysics, viz.: the ontological problem and the cosmo-theological problem. In the former chapter materialism, panpsychism, and the nature of the soul are discussed, while the second chapter is devoted to atomism and teleological theism, implying such subjects as the theory of evolution, causality, pantheism. The second part reviews, in the first chapter, the problems of the theory of cognition, viz.: the idealistic arguments, the realistic views, and our knowledge of the outer world. The second chapter presents an exposé of the problems regarding the origin of cognition as viewed by rationalism and empiricism, paying special attention to Kant's formalistic realism. The conclusion is a brief treatment of some ethical problems.

It is impossible to discuss all the details of the 444 pages of Paulsen's book, but a few specimen quotations from the chapter "Pantheism and World-soul" may be welcome to our readers. Our author asks: Considering all the tendencies of yearning and willing that appear in the innumerable forms of reality, is there a unity of

inner life corresponding to the unity of the physical world in its universal interaction? The affirmation of this question constitutes the idealistic pantheism.

Idealistic pantheism is to Professor Paulsen the simplest and most obvious construction of the world possible. To other world-views, the existence of the soul is a problem; it has even been called an "absolute problem." "I believe," he adds, with great truth, "that there can be no stronger argument against any world-"view than that it regards the existence of soul as something absolutely mysteri-"ous." There is a power of conviction in idealistic pantheism verified by the astonishing agreement of the testimonies of many various thinkers in the Orient as well as in the Occident, in antiquity no less than in modern times. (P. 243.)

Says Professor Paulsen: "The dayfly may imagine when the sun sinks that "all is at an end; light vanishes forever and the whole world is swallowed up in "darkness and death. But man who sees so many suns sink and rise should have "learned that in the infinite there are many possibilities which he cannot see at "present [p. 241]. The conception of a world-soul, of a spiritual all-being, of a "*mundus intelligibilis* appears to our physicists and physiologists in the same light "as the conception of anthropomorphic deities—as a childish dream. They have no "need of this hypothesis [pp. 243–244]. Du Bois-Reymond declares that a natur-"alist before admitting the assumption of a world-soul should demand, 'that we "ought to find somewhere in the world neuroglia embedded in warm arterial blood "under the proper pressure and provided with appropriate sense-organs, ganglions, "and fibres, corresponding to the intellectual capacities of such a soul.' An ani-"mal," says Paulsen, "needs as a matter of course legs to stand upon and to move "with, a stomach, teeth, eyes, and a central nervous system, but the All is not in "need of this; it needs no legs to stand upon and to move with, no stomach for ali-"mentary purposes, no eyes, no ears, for there is nothing to be seen or heard out-"side of it, and so it can also dispense with a nervous system and a brain."

Quoting two passages, one from Fechner, the other from Nägeli, to the effect that the system of fixed stars might be regarded as a group of molecules in an infinitely larger whole which we should have to conceive of as a unitary organism, Paulsen says: "Indeed, there is no objection to regarding a planet as a ganglion of "the world-brain. Is it too large? No. Why should not the world-brain have "bigger cells than an animal brain. Or is its composition inappropriate? Why? "We find in it the same materials, carbon, oxygen, nitrogen, iron, phosphorus, and "so forth, and also innumerable interactions similar for all we know to those that "take place in a ganglion. Who knows how striking would be the resemblance of "their structures, if we could but see a ganglion under a sufficiently powerful mag-"nifying glass."

These ideas are mere possibilities and are presented as such, but we cannot attribute to them any philosophical, scientific, or religious importance. Our idea of "a world-soul" or, better, of God, is different and we avoid purposely anything that can be constructed upon the basis of a vague hypothesis.

We ourselves reject pantheism, the view which identifies God and the All for reasons which we need not repeat here. We call our view of God entheism, and in forming our idea of God we purposely avoid such fantastical assumptions as considering the possibility of solar systems being molecules in the organism of a huge world-animal. Granted the truth of this view, the mere possibility of which we cannot deny, this extraordinary creature or world-animal would not be God, its will would not be our moral authority; it would not be the eternal, the immutable, the ground of all being, the ultimate rule of action, and the omnipotent universal law of existence: it would merely be a creature like ourselves, only immeasurably bigger, evolving like other animals and subject to the same or analogous or perhaps similar wants, disappointments, sufferings, and joys as ourselves. What a miserable God such a world-being would be; we know nothing of him and he knows nothing of us. His will and aspirations would have even less influence upon our aspirations, than, for instance, the hopes of a man upon the molecular groupings in his tissues, we being only the parasites upon the crust of an atom of his tissues. We have presented our view of the subject in Vol. III, No. 2, pp. 249–257, of *The Monist*, in the third part of the article "Panpsychism and Panbiotism," with reference to a similar hypothesis incidentally touched upon as a possibility of monistic theism by Professor Romanes.

We simply state the difference between our position and that of Professor Paulsen concerning the nature of a world-soul without intending to make more of it than he does himself; for, if we are not mistaken, it is with him a mere suggestion.

We conclude our review with a passage which shows Professor Paulsen's attitude toward Christianity, which more than anything else proves the general agreement of his work with ours. He says:

"The Christian faith is not a philosophical system, not a theological dogma "and still less the residue of an old superstition, but the immediate and living cer- "tainty of the heart concerning the nature of the good and its importance in real "life. This faith can be to-day the same as it was in Luther's, or St. Augustine's, "or the apostles' time who saw Jesus with their own eyes bodily. If Christianity, "did indeed consist of a number of doctrines and opinions, it would certainly be "true, as some claim, that it has been dead a long time, for doctrines and opinions "are not long-lived. If Christianity really did consist of the belief in the creation "of the world five thousand years ago out of nothing, the rib story of Eve, the story "of Eden and the fall, etc., etc., ... then indeed it would be impossible for a "thinking man of to-day to be a Christian. But all that is not the faith of Chris- "tianity, it is not the religion of Jesus. And if all the leaders of all the confessions "declare that this is the Christian faith and that he who does not believe all these "things can have no part in Christ, their proposition must be rejected as untrue. "No one can be saved by believing these things; while the request of the church "to believe in certain opinions set forth by men has expelled many an honest man. ". . . . In the life and death of Jesus I have learned to understand the meaning of

"life and I call God and the revelation of God that which makes my life possible "and explains to me the significance of my life. . . . Is such a faith compatible "with the above-mentioned monistic world-conception? My answer is, By all "means."

This is Professor Paulsen's solution of the problem of a reconciliation of science and religion—and we add that it is ours too. P. C

FIRST STEPS IN PHILOSOPHY. By *William Mackintire Salter*. Chicago: C. H. Kerr & Co. 1892. Price, $1.00. Pages, 155.

This little book is divided into two parts: (1) Physical, (2) Ethical. In the first, Mr. Salter discusses the conception of matter; in the second, that of duty. Mr. Salter's philosophical position is epitomised in a sentence which he quotes from Herbert Spencer. This sentence states, that, "what we are conscious of as proper-"ties of matter, even down to its weight and resistance, are but subjective affections "produced by objective agencies which are unknown and unknowable." Mr. Salter's philosophical position, accordingly, is, first, Idealism, and, second, Agnosticism.

In ethics, Mr. Salter's view embraces Utilitarianism, or Hedonism, and Intuitionism, both of which, he says, are incomplete in themselves, and must be supplemented by other elements Utilitarianism makes happiness the ultimate end; Intuitionism, virtue; and Mr. Salter adds, such an end must embrace the "realisa-"tion of *all* our capacities." Mr. Salter's ethical position has been before discussed in our journals.

If we study Mr. Salter's philosophical views, we shall find that his theory is a reproduction of Berkeley's analysis of the data of knowledge, embellished by the results of modern physiological psychology. Yet Mr. Salter's theory, although it everywhere shows the traces of a close study of Berkeley's views, presents the strange historical anomaly of undoing Berkeley's work. Berkeley's undoubted aim was to place knowledge on a basis of fact and refute, in a philosophical manner, the agnosticism, metaphysicism, and transcendentalism prevalent in his day. But Mr. Salter adds to Berkeley's results the very things that Berkeley sought to overthrow, and thus renders the latter's analysis (and consequently his own) in need of an equivalent analysis.

Take, for instance, the above-quoted sentence from Herbert Spencer, to which Mr. Salter assents. "Objective agencies," "unknown and unknowable"! Is this consistent? All knowledge is a knowledge of sensations, a knowledge *of* and *in* the mind, says the idealist, and we cannot, by any process of ratiocination, arrive at things "outside" the mind. Yet he himself, it seems, arrives at a knowledge of "objective agencies" outside the mind (pp. 65, 69), and, what is more wonderful, at agencies that are "unknown" and "unknowable." Surely, this is not abiding by an analysis of the facts of sensation (Berkeley). It is as unrational a procedure to infer metaphysical objective agencies, as it is to infer a metaphysical substratum "matter," which last is the error of the realist.

Again, take the notion of cause. Here, also, the same unwarrantable abandonment of the facts of sensation, i. e. of *all that is*, is evident.

At the end of an analysis, in which he shows that "all the choir of Heaven and the furniture of the earth," and "all which it inhabit," retreat and vanish in mind, Mr. Salter asks: "But is there absolutely nothing real and objective left? "So far as sensible phenomena are concerned, we must answer, No, absolutely "nothing is left; the whole sensible (material) world is but an effect upon ourselves. "But," he adds, "it would be a hasty inference," on these grounds, "to say that "nothing whatever is left." And when asked "what is left," he answers, "all "that causes sensation." We can never know scientifically what these causes are, but "we have an inextinguishable faith" *that* they are, "there being no particular "thing we are more sure of than that for every event (and every sensible phenome- "non is an event, viz., in ourselves) there is some kind of explanation or cause." To sum up: The theory of "sensible or physical idealism"* implies a "super- "sensible or metaphysical realism." In the theory of sensible idealism things only exist as sensations; "only exist, that is, *save in their supersensible or transcendental "causes*"—which, says the author, we must always add.

What is a cause? Cause is an abstraction. An abstraction from what? from a real, physical world, or from a metaphysical, transcendental world? Plainly, from our real world, from Mr. Salter's world of "sensible reality." By what philosophical warrant, then, is this concept applied to a world from which it has not been derived and to which it surely cannot apply! It is wrong to speak of a cause of the All. The All has no cause, just as it has no weight.

All these difficulties arise from the notion that there are two kinds of knowledge and two kinds of existences. Idealism, to be consistent, must be absolute; Mr. Salter's idealism is not absolute. This is exactly the criticism that the reading of his book at once forces on one. All knowledge is knowledge of sensations, i. e. of reality; things not accessible to sensation are not real, they do not exist; consequently, all entities transcendental, metaphysical, and supersensible do not exist This is the conclusion to which any philosophy, idealism, realism, or what not *must* lead.

Nowadays, few people dispute the fundamental thesis of idealism (of course, expressed in different terms from those of Mr. Spencer's sentence). In a sense, it is established. Its only drawback is, that its "establishment" accomplishes nothing. It leaves the problem of philosophy where it found it.† Reality is still reality. The same difficulties and perplexities exist. The universe still mocks us. And foremost among the riddles that the world opposes to man, stands that eternal

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* Mr. Salter's name for his theory.

† Says Mr. Salter: "Idealism (as here stated) is not, however, itself a solution, being only a clear statement of what the problem is; and for all that such idealism can say, the problem may be insoluble."

query: "What is mind?" Mr. Salter's views of this question will show us what contributions his theory is likely to make to philosophy.

Mr. Salter defines mind as "that which experiences sensations and thoughts, "or, more simply, that which feels and thinks." It is not feeling, not thinking, but *that which* feels and thinks. It is thus an agent, a subject. It is difficult to understand how this notion of mind is come at, without self-contradiction. In their origin, all notions of mind-subjects, mind-essences, mind-agencies, and so forth, are materialistic. They must be volatilised and stripped of their substantial attributes, if they are to take a place in an idealistic philosophy, and then, as they "cannot be "ranged along with the sensible phenomena of which the mind takes cognisance," there is but one realm left to exist in, which is the transcendentalistic.

All this comes from carrying the abstraction by which "mind" is reached, to mathematically infinite limits. In this abstraction the world retreats and fades away into nothingness. And what is left? Not a single idea or fact by which we can fix our abstraction. Mind is all, and mind is nothing. It is not matter, not time, not space—not even a mathematical point, which we expect it to become in its infinitely contracting perspective. It has no attributes, no qualities; it is nothing and nowhere. This conception of mind, Mr. Salter says, is only mysterious as we *make* it so, by careless and inaccurate thinking. And Mr. Salter is right. It would require much careless thinking to make such a conception mysterious. A thing or notion that cannot be defined, placed, or brought into connection with any other thing or notion in the world, is not *mysterious*, but simply does not exist. In that respect, it is as plain as day.

The same confusion exists in the discussion which disposes of the query, "*Where* is mind?" The idealist, in Mr. Salter's sense, does not admit that the mind is in, or in anywise spatially connected with, the brain. The question, *where* is mind? he says, has no meaning, any more than the question, what is the color of a pleasure? This is true. Mind is an abstraction. In this sense it has no spatial existence. But the phenomena from which this abstraction has produced itself, *are* linked with phenomena which have spatial existence, and in this sense the mental processes are not mysterious nothings and nowheres. When I lose that group of sensations called my leg, I know that, generally, I have lost the feeling of my leg. So, also, when a certain part of that group of sensations called my brain is destroyed, I know that I shall then have lost my power of memory or of speech or of motion. I may also experiment with other groups of sensations called dogs and cats, which I know have mental powers. In the light of these facts it is not correct, either in philosophy or common sense, to say that mental processes are absolutely independent of locality. I know that my thoughts are not connected with the group of sensations I call the moon, and I know they are not connected with that group of sensations that I call Mr. Smith. I am always aware of them as connected with that group of sensations which I call "myself."

Mr. Salter, in fact, half recognises this. He says, "The mind *is* dependent on

"the body in the sense that our general power of sensation and thought is connected "with those sensations we call our body." Yet, "why this should be so is myste- "rious." Indeed! One is inclined to ask Mr. Salter here, what species of explanation or knowledge he wishes of this phenomenon. Is explanation, or knowledge, something more than the recognition and seeing of a plain connection between the groups of sensations that constitute reality? In Mr. Salter's analysis, all the facts of the world are mysterious. Why a thing is as it is and is not other than it is, is mysterious. He utterly fails to understand why the power of perceiving colors is linked with the particular group of sensations he calls his eye, and why it should not just as well be linked with some other group or no group at all.

Why do I see with my eye? Why do I not see with my hand or with the hairs of my head, or why do I not eat with my elbow, instead of my mouth? Why do not stones fall upwards? Why do not magnets point towards the East? Why do not the planets move about Jupiter or Saturn? Mr. Salter's question makes a jumble of the whole universe.

It is not the object of science or philosophy to find out why things are not what they are, but to find out what they are. In this inquiry the why and wherefore, properly understood, will evolve themselves.

Science simply concerns itself with the connection of the groups of sensations which the idealist, and for that matter every one else, calls reality. It cannot concern itself with anything else. All other things are artificial and self-made existences. Nothing exists but reality and the connections of reality. To seek for any other connections than those that exist is absurd and futile. And to seek for any other causes or cause of relations than such as really are is also futile. Before we speak of the knowledge of a thing we must analyse and define our notion of knowledge, and before we speak of the cause of a thing we must analyse and define our notion of cause. In our view, the relation which Mr. Salter doubts, is so intimately and inextricably one, that the causal relation disappears. Neither is the cause of the other. We may, for the purposes of inquiry, start from either as our general concept, but we should never go so far as utterly to expel from reality the other. True science and philosophy are neither idealistic nor materialistic, but *real*. The two positions are extreme positions, and each is useful only as a safeguard against the errors of the others. Reality is reality; that is the main thing. Whether it is idealistic or materialistic is of minor consequence. Besides reality there is nothing; its negation is non-existence.

We do not wish in these criticisms to repudiate all that is in Mr. Salter's book. A great many of its reflections are helpful and suggestive. We may refer, for example, to the passages in which the body is regarded as a gradually decreasing wall of separation between that part of reality which is known subjectively and that part which is known objectively. This is really a unitary view. We believe, however, that if Mr. Salter would carefully analyse the notions of knowledge, explanation, cause, effect, and, therefore, the notion of reality, he would not push his philosophy

to the mysterious extreme at which it finally arrives, and he would absolutely reject such unscientific conceptions as supersensible realism, metaphysical realism, and supersensible or transcendental causes. These render the reading of his book as a philosophical help unsatisfactory, and leave the mind even more confused and perplexed than it was before. However, all discussions of this sort have their value, and Mr. Salter's book possesses a virtue which few other philosophical productions can boast of: it is very short. The author's pleasant style will also add to the pleasure of its perusal, and if read critically the book will evoke much helpful thought.

T. J. McCormack.

A Review of the Systems of Ethics Founded on the Theory of Evolution. By *C. M. Williams*. New York and London: Macmillan & Co. 1893.

This is a book, the perusal of which will leave the earnest student of moral science full of disappointment. Not at all that it manifests any lack of ability or information. On the contrary, it is at once clearly and entertainingly written, and at the same time packed with notes and comments that are full of interest and instruction.

The course of the book may be briefly stated. The first part, comprising nearly half of its six hundred pages, is devoted to the statement of the ethical doctrines maintained by thirteen prominent writers, whose views have been formed more or less under the influence of the theory of evolution, viz.: Darwin, Wallace, Haeckel, Spencer, Fiske, Rolph, Baratt, Stephen, Carneri, Höffding, Gizycki, Alexander, and Paul Ree. The rest of the book is the review of our author. This review is conducted under the topical heads: The Concepts of Evolution; Intelligence and End; The Will; Thought, Feeling, and Will in Evolution; Egoism and Altruism in Evolution; Conscience; Moral Progress in History; The Results of Ethical Inquiry on an Evolutional Basis; and The Ideal and the Way of Its Attainment.

These are all topics of great interest and importance, and the author has brought to the consideration of them a mind fully stored and entirely competent. But we look in vain for that discourse and criticism which above all other matters relating to moral science those who are interested in human welfare crave from those who tender their reflections upon ethical topics.

The great need of moral science is the discovery and certification of its basis. It is a need that far transcends the scope of mere moral science, for upon its right determination depends the right determination of a multitude of questions that deeply involve the welfare of humanity. It is a need that is not merely crying to be supplied. It is absolutely wailing. Could it only be rightly determined, mankind would fast enough orient itself in the course of evolution and with undissipated energy work out its best possible development. But undiscovered or uncertified it balks all process, save only that mechanical, halting, stumbling process that has hitherto obtained; a process that is, as all may observe, one that has little if any inward coördination, but is full of inability and cross-purposes. Since it was the

professed purpose of our author to review a number of the more prominent systems of ethics, which he esteems to be founded on the theory of evolution, his failure to notice and to comment upon so conspicuous a feature of moral science would naturally lead a reader, unversed in the works noticed, to suppose that those works had altogether slighted this topic. Such is, however, not the case. With the exception of perhaps Darwin and Wallace, all the writers reviewed by our author have given more or less attention to this matter, and they have left us in no doubt as to the positions which they severally hold. Most of them are Hedonists of one sort or another. Haeckel, Carneri, Rolph, and Alexander are, we believe, the only exceptions.

But a more serious criticism upon the work under notice is suggested by its very title. That title as much as says that the various works which are reviewed by our author are "founded" upon the theory of evolution, at least in so far as their ethical doctrines are concerned.

Now, what is the theory of evolution? What is its essential nature? Does not its very form consist in the affirmation of an eternal secular mutation, in which there is no discontinuity whatever? It says that existence in sum and in every detail is eternal and continuous process. It uncompromisingly forbids all suppositions of any absolute beginning, or of any absolute end, or of any absolutely final adjustment. Hence, no system of ethics can with truth be said to be "founded" upon the theory of evolution that ignores or forgets this essential character of it. Now, when we turn to the consideration of the various "systems" which our author supposes to be "founded" upon the theory of evolution, we find them, one and all, occupied more or less with suppositions of ends. All are forecasting some "ideal" condition, which, being attained, all chances of retrogression will be foreclosed and all possibilities of betterment will be exhausted. In other words, they suppose an attainment of death, or rather an attainment of a death-in-life more utterly horrible than any actual death can possibly be. The very first condition for an ethics that will be truly evolutional must be the fit and full recognition of a boundless horizon to evolution in morals as well as in all else. Emerson perceived the truth when he said in "The Sphynx":

> "Profounder, profounder
> Man's spirit must dive;
> To his aye rolling orb
> No goal will arrive.
> The heavens that now draw him
> With sweetness untold,
> Once found; for *new* heavens
> He spurneth the old."

And at present, the most serious efforts to establish a truly clear-sighted ethics of evolution, with an unequivocal disavowal of any and all Hedonism, is made by the editors of *The Monist*. It, indeed, is the key-note of the missionary work that characterises all the publications of The Open Court Publishing Co.

Any truly evolutional ethics must show itself a doctrine that applies just as well to regress as to progress. Evolution is too often confounded with progress, but degeneration is just as truly evolutional as is the contrary movement, and, looking the facts of existence in the face, mankind has no assurance of any unchangeable course of betterment. The principles of morals are, however, not dependent upon the benign action of nature. When the earth's stock of fuel shall become exhausted, or when the ice age returns, or when the sun grows cold, there will be no alteration thereby in the moral law. Good and evil must and will be the same under all circumstances, and no system of ethics is nor can be anything but a temporary makeshift, that does not as well fit the *diastoles* as it does the *systoles* of existence. We must look for a doctrine that shall inform the conduct of men not only for the fore part of the day, when all is jubilant and bounding and man asks only for some good task to do, but also for the evening and night, when man grows weary and craves for rest; for not only youth and maturity, but for waning strength, old age, and death; for not only the progressive era of cosmic history, but for the periods when natural conditions may disfavor mankind, when, say, man may gradually be so reduced in resources that the same will barely suffice for simple life-preservation; when under the stress of natural conditions the human intellect, in the course of generations, becomes step by step eliminated; when indeed humanity itself tends perhaps slowly, but with certainty, towards permanent extinction.

They who complacently protest that the theory of evolution leaves the domain of moral science substantially unaffected are surely in great default either in their comprehension of the nature and implications of that theory, or in their powers of circumspection, while those who suppose that moral science becomes evolutional simply because of a little application of that theory to some of the subordinate questions that are involved, show themselves in a plight as bad as the others if not worse.

Our author notices without dissent, and even with seeming concurrence, the various remarks made by many of the writers reviewed by him in discredit of teleology.

Since as we have before protested the theory of evolution forbids all suppositions of any ends that are absolutely final, it of course follows that teleology is in the strictness of its meaning inadmissible, even in ethics. But in dismissing teleology, let us not pour out the child with the bath. However it ought to be with the interpretation of the order of nature as a speculative exercise, something that is analogous to teleology is an absolute necessity if ethics is to be anything more than a curious study of human practise. The universe may manifest no purpose, design or secular tendency, but man is and can be nothing but a miserable estray on the ocean of existence unless he sails on a course, instead of merely drifting. To do this he must take something by which to steer, and any plausible stability is better than no bearings whatever. At any rate man is insuperably drawn to thus mark out his course. If the theory of evolution forbids him to suppose any ends that are ab-

solutely final, it does not prevent him from ascertaining directions. Indeed evolution affords him data of the very first importance for that behoof. Instead of ends we have aims and if ethics is to become that counsel and guide to humanity, which we yearn for so anxiously, it must ascertain and certify that single paramount aim to which all other tendencies are naturally subsidiary. Teleology, or rather the determination of the aim of evolution, must prepare the foundation before any evolutional ethics that is worthy the name can be established.

Again our author with considerable debate notices the remarks of the writers reviewed by him on the old question of free will and necessity,—but like the positing of some end or aim to be subserved, free will is one of the presuppositions of ethics. When man begins to debate the possibility of rightly ascertaining the true end or aim for his pursuit, or when he begins to moot the question of free will, he is debating not any question of ethics proper, but only whether such a science is possible. Unless conditions and events are functions, as well of man's personality as of his environment; unless persons count for something in the variations of the course of nature, it is altogether vain and idle to be troubled with questions of morality.

Free will and somewhat to be achieved are principles which whether well or ill founded, ethics proper must take for granted before it has or can have any *raison d'être*. As for free will, however the metaphysicians may have stumbled over their own feet, the common sense of mankind has never wavered. As a practical question (and ethics is pre-eminently a matter of practice) this question is not an open one.

But on the question of what is the true paramount aim for man to pursue, the decision that shall finally satisfy man is yet to be made. The best proof that no satisfactory answer has yet been made is the fact that we are still seeking an answer. As with regard to the needful prime condition for a truly evolutional ethics we found wisdom in the poetical insight, so again in this exigency we personally find the most profound ethical philosophy in that same insight.

> " 'Tis Life of which our nerves are scant.
> 'Tis Life, not death for which we pant,
> More Life, and fuller that we want."

FRANCIS C. RUSSELL.

DER PESSIMISMUS IM LICHTE EINER HÖHEREN WELTAUFFASSUNG. By *Dr. J. Friedländer* and *Dr. M. Berendt*. Berlin W.: S. Gerstmann. 1893.

The authors' aim is the refutation of pessimism and the foundation of a higher world-conception. This latter is a pantheism spiritualised by moral ideals and contrasted to Darwinism and materialism. Natural science is said to be the surrounding walls of the new view, furnishing (1) negative truths of criticism and (2) a knowledge of the positive features of nature. The negative truths are: the impossibility of the existence of a personal God, of the efficiency of prayer, of miracles, of the immortality of the soul, of the separate existence of souls without bodies.

The positive results of natural science are the unity of nature, the indestructibility of nature, the harmony of the All, the indivisibility of nature, the irrefragable necessity of natural processes according to immutable laws, and the freedom or independence of nature, as having its cause in itself, uncreated and uninfluenced by any extramundane being.

Natural science alone, according to the authors, is not sufficient to constitute the new world-conception. A one-sided view of natural science together with the obsolete conceptions of theism are exactly what has brought forth the philosophical pessimism of our time. Natural science, accordingly, is not to be regarded as the sole source of truth; it is to be corrected by pantheism. The former teaches us "to regard matter and its motion, so to say, as a dead inert substance to which motion is attached; it treats matter as an immediate reality. Pantheism, however, teaches that matter is to be conceived as the interrelation of the innumerable live acts of will appearing successively in time and side by side in space," etc. The authors point out that the necessity of law which regulates the mechanical processes of nature does not exclude freedom; for "freedom is not arbitrariness but is controlled by an immanent *Gesetzmässigkeit*."

This summary is sufficient to characterise the ideas of the Drs. Friedländer and Berendt. We cannot say that they admit of no criticism, (e. g. their conception of natural science must be pronounced as too narrow if not actually erroneous, nor should the law of the survival of the fittest be interpreted in the sense that strength means brutal force,) but we can, nevertheless, express our sympathy with the aim of the authors as well as with the spirit in which they pursue it. κρς.

DIE PHILOSOPHIE UND DIE SOCIALE FRAGE. By *Gustav Engel*. Leipsic: C. E. M. Pfeffer. 1892.

ACHT ABHANDLUNGEN, HERRN PROFESSOR DR. KARL LUDWIG MICHELET ZUM 90. GEBURTSTAG ALS FESTGRUSS DARGEREICHT VON MITGLIEDERN DER PHILOSOPHISCHEN GESELLSCHAFT. Leipsic: C. E. M. Pfeffer. 1892.

WIE STEHT ES JETZT MIT DER PHILOSOPHIE, UND WAS HABEN WIR VON IHR ZU HOFFEN? By *Dr. Wilhelm Paszkowski*. Halle a. S.: F. Beyer, 1892.

This lecture by the well-known writer on the science of statistics and its related subjects was read before the Philosophical Society of Berlin on the 31st of May, 1890. It discusses the problem of socialism, or rather the aspirations of the German social democracy from the philosophical point of view of the lecturer, which is a modernised Hegelianism. This lecture drew forth on the evening of its delivery considerable discussion, which was participated in by Herr Kahle, a socialist, and Herr Runze. The discussions of these gentlemen, together with Mr. Engel's reply, are embodied in the pamphlet.

The second of these two pamphlets is also a publication of the Philosophical Society of Berlin. It consists of eight treatises, essays, or lectures, which were pre-

sented by the members of the society to Prof. Karl Ludwig Michelet as a festival gift on his ninetieth natal day. The authors of these eight essays are: Adolf Lasson, August Cieszkowski, Gustav Engel, Friedrich Kirchner, Wilhelm Paszkowski, Max Runze, Georg Ulrich, and F. Zelle. They deal with philosophical subjects, chiefly such as pertain to the Hegelian philosophy. Appended to the pamphlet is a bibliography of the writings of this Nestor of the Philosophical Society by F. Ascherson.

The author of the third pamphlet complains about the decay of philosophy: "Metaphysics, the inner fane in the temple of science, stands desolate," and the last disciples of Hegel can no longer prevent the deluge which sweeps away the idealism of their grand old master. κρς.

DER MATERIALISMUS, EINE VERIRRUNG DES MENSCHLICHEN GEISTES, WIDERLEGT DURCH EINE ZEITGEMÄSSE WELTANSCHAUUNG. By *Dr. Eugen Dreher*. Berlin: S. Gerstmann. 1892.

The author of this pamphlet, at present a docent at the University of Halle, feels somewhat oppressed by the materialistic tendencies of our times. His desire is to establish in the world a province of the ideal, and this domain of idealistic aspirations and hopes, he says, must and can be based upon a scientific foundation. To reach this goal, the author propounds a philosophy which is confessedly dualistic, and which must be made a kind of religion. Descartes's *Cogito, ergo sum*, is to him the beginning of all philosophy. The existence of the All is devoid of sense, unless there is an ego to think it. This dualism, if made a religion, will throw light upon the problems of the labyrinth of life.

The aspirations of the author are serious and noble. We cannot, however, agree with the results of his reasonings. He does not seem to have considered Kant's objections to the fallacy of the *cogito, ergo "ego" sum*. Nor is he familiar with Lichtenberg's famous remark, that "we should say by rights 'it thinks,' exactly as we say 'it rains.'" The same moral conclusions at which the author arrives may be reached, the same province for ideal aspirations in the world may be gained, the same religious comfort may be found, without any surrender of the monistic view of the world. Materialism is an error of human thought. But the error cannot be cured by dualism. κρς.

UEBER DIE GRUNDFORMEN DER VORSTELLUNGSVERBINDUNG. Psychologische Studie. By *Max Offner*. Marburg: R. Friedrich. 1892.

This little brochure is a carefully worked out study of the phenomena of association. The author's view is summed up in the following statement: "The attempt to reduce the phenomena of association, in conformity with their real nature, to one single ultimate process cannot be regarded as successful, and we shall have to control our aspirations after a unitary conception and rest satisfied with reducing the various phenomena of association to two processes which are closely

"related, namely: (1) to an association of simultaneity; and (2) to an association of "immediate succession." There is much that is suggestive in the sixty-seven pages of this pamphlet. *κρς.*

FINITE HOMOGENEOUS STRAIN, FLOW, AND RUPTURE OF ROCKS. Bulletin of the Geological Society of America. By *George F. Becker*. Rochester: Published by the Society. 1893.

This is a purely technical research, concerning the causes and form of the discontinuity of rock masses. The studies presented are the outgrowth of field-work in the Sierra Nevada of California. This range is so intersected by false joints, schistose and slaty cleavages, that on a scale of one mile to the inch their average separation would be for the most part microscopic. The dynamic manifestations in these regions are very systematic. Some of the strains which have produced this phenomenon have been infinitesimal, and others have been finite. Only the latter are here treated. Finite strain, the relations of stress to strain, the nature of finite shear, viscosity, flow, plasticity, ductility, and rupture, the relation of plastic solids to fluids, the spacing of fissures formed by inclined pressures, jointing, and slaty cleavage, are the chief subjects discussed. The most important result of the investigation is that jointing, schistosity, and slaty cleavage all imply relative movement and are thus as truly orogenic as falls of notable throw. "In the light of this conclusion," says the author, "it appears that if one could reproduce the orogeny of "the Sierra in a moderate interval of time on a model made to a scale of one mile "to the inch, it would seem to yield to external and bodily forces much like a mass "of lard of the same dimensions."

This pamphlet is neatly got up, and reflects credit upon the author and publisher. *μκρκ.*

DER ECHTE UND DER XENOPHONTISCHE SOKRATES. By *Karl Joël*. Volume I. Berlin: R. Gaertner. 1893.

There are two sources from which we have derived the main bulk of our knowledge concerning Socrates; namely, the writings of Plato and Xenophon. The former is generally regarded as an idealiser, and the latter as an historical biographer; for Plato simply uses the impressive figure of Socrates to expound his own philosophy, while Xenophon, the general, the politician, the historian, is supposed to give in the "Memorabilia" a simple and faithful account of what appeared to him worthy of being preserved. As Xenophon was not a philosopher himself, it is tacitly assumed that he had no reason to alter, to suppress, or to add his own personal views to the historical account of the great master whom he bore in grateful remembrance as a faithful disciple. There are some other sources; but they are less rich than those of Plato and Xenophon. Among them must be mentioned several passages in Aristotle, especially in "Magna Moralia" I, p. 1182, *a* 15. Our author urges with

good reason that the Xenophontic Socrates is radically different from and even opposed to the real Socrates, and that we ought to rely more on Aristotle than on Xenophon. Xenophon's "Memorabilia," Karl Joël declares, is not an historical writing but a *Tendenzschrift*, and we have to be on our guard wherever Xenophon's special tendency comes in.

Socrates is the representative of the philosophical spirit of Attica, and the character of his teachings may in a word be described as a noble and sublimated subjectivism. Socrates is a rationalist and as such he opposes the mysticism of the soothsayer and mantic. He goes so far in his rationalism as to identify knowledge and virtue. He cannot understand, from his point of view, (which regards the soul as a rational being only and leaves out of sight the existence of impulses,) that a man can knowingly neglect to choose the better thing and choose the worse. Plato, in order to avoid the error of Socrates, invented the distinction between the rational and irrational part of the soul and Aristotle criticises Socrates saying *τὰς γὰρ ἀρετὰς ἐπιστήμας ἐποίει.*

The subjectivism of Socrates appears in his trust in the *δαιμόνιον*, the divine voice within his soul, his rationalism in his constant request to gather information before beginning to act. He exhibits in his talks great irony; for instance, when telling a politician that as a shoemaker must know his trade before making shoes, so he, the politician, ought to know *his* business before undertaking to manage affairs of state. Again and again he satirises the bungling levity of men who imagine that in the greatest and gravest things of life they can act without any information. Both the subjectivism and rationalism of Socrates appear in his constant inculcation of the Delphian motto "know thyself."

What a different character is Xenophon! He was a convinced believer in manticism. There are more than a hundred passages in his writings in which not rational forethought but the art of the soothsayer is left to decide the most important questions of practical life. When the courageous ten thousand offered him the leadership in their dangerous retreat, his ambition urged him to accept, but he first asks the God, and the omens being unfavorable, he refuses. He did not accept the offer until he had received another more auspicious omen. In the same way Xenophon acts throughout. All important decisions which prudence would urge, are made dependent upon sacrifices, dreams, or the flight of birds, and more than once the safety of the army is greatly endangered by a fatal passivity caused through unfavorable omens which prevent Xenophon's acting with decision at the right moment. It is no exaggeration to say that these ten thousand Greek soldiers escaped only by good luck the fate of the Athenian army in Sicily under Nikias. And this man, a zealous believer in manticism, should be an impartial and reliable historian of the doctrines of Socrates? The *δαιμόνιον* of Socrates is changed into a mystic power, a kind of *spiritus familiaris*. It has ceased to be the divinity of man's inner self as which it appears in Plato's account, and is represented by Xenophon as some peculiarity of Socrates which was given him as a special favor by the gods. Socrates

dethroned the old fate that was supposed to rule the affairs of men and pointed out the importance of knowledge, for through knowledge we can learn to regulate our fate ourselves. The philosopher who thought little of well-being, of *εὐτυχία*, and demanded above all a well-doing, an *εὖ πράττειν* ("Memorabilia," III, 9, 14, 15,) did not recommend asking soothsayers questions where we should better ask ourselves, although it is probable that he recommended the Athenians to apply to the Delphic oracle instead of relying upon omens not so much because he believed in prophesies, but because he thought that they would be influenced by the authority of this venerable institution whose wisdom and conservative spirit were beyond question, so that good advice could be expected from it. Karl Joël, accordingly, advises us to read the "Memorabilia" with an inversion of the points, viz., to convert the sentences qualified by "although" and "to be sure" into the main sentences and *vice versa*. In this way we shall be able to distinguish between the pagan orthodoxy of Xenophon and the rationalism of Socrates. Why does Xenophon not state directly and simply (1) Socrates advised his friend to ask the oracles in all cases of uncertainty, (2) manticism is indispensable in the economy of a household as well as of a state, and (3) the gods have not granted us any real knowledge as to a final success and reveal it through special revelations. Why must he add long sentences introduced by "although"? He adds to (1) that everybody ought to act solely according to his own conviction, to (2) that all the trades up to the highest professions had to be learned before practiced, and to (3) that those who inquired at the oracles for things which could be learned and studied in the usual way are crazy and even blasphemers.

This sketch may suffice to characterise the book which is much better than could be anticipated after a perusal of the preface, which almost induced us to lay it aside unread. It is not the modesty of the author which produces a prejudice but the random talk concerning things which neither a reader nor a reviewer will care to know. The author has apparently no talent for writing prefaces, and he would be wise to omit them in the future entirely. The book might be very much condensed, repetitions avoided, and an alphabetical index certainly should have been added.

It contains *five hundred and fifty-four* pages; and the author says he is preparing a *second* volume. We think it would have been better for his views if he had expressed them in a pamphlet. κρς.

A Perplexed Philosopher. Being an examination of Mr. Herbert Spencer's various utterances on the land question, with some incidental reference to his synthetic philosophy. By *Henry George*. New York: Charles L. Webster & Company. 320 pp.

The "Perplexed Philosopher" herein described is Mr. Herbert Spencer, and persons who like ginger in their ale will enjoy this book; for its eloquent invective, hot from the heart, cheers us like that stimulating drink. Because of this fiery and

revengeful attack on Herbert Spencer much dignified reproof has been aimed at Mr. George by those excellent people who religiously forgive the injuries done to others, and allow only to themselves the luxury of retaliation; but when we consider the provocation given by Mr. Spencer, this counter-blow of Mr. George is mild. Mr. Spencer had a critic's right severely or tenderly to condemn the doctrines of Mr. George; and had he kept himself within his privilege Mr. George in reply would not have had any right to assail the personal character and motives of Mr. Spencer; but the older philosopher chose to treat the younger with supercilious disdain, and this was a personal affront that fully justified a retort personal. Scorn is an ignoble argument, lawful only in return for scorn.

Apart from the truth or error they contain, the writings of Mr. George have achieved a phenomenal popularity; their influence on social opinion has been in some directions almost revolutionary; they are to-day the political creed of many men in different parts of the world, and especially of many thousands in America, Great Britain, and Australia. They are bold in theories, attractive in illustration, and admirable in their literary form. Their approval of "Social Statics" was an advertisement that multiplied by hundreds the readers of that book, and there is no philosopher great enough to affect ignorance of Mr. George's writings, or to dismiss them with a sneer. More copies of "Progress and Poverty" have been sold than of any other book on social economics that ever has been written, and when Mr. Spencer spoke of that book as "a work which I closed after a few minutes on finding how visionary were its ideas," he put on airs of aggravating superiority which naturally provoked the resentment of Mr. George.

After not reading the book Mr. Spencer condemned its heresies and said:

"There is the movement for land nationalisation pressed by Mr. George and "his friends with avowed disregard for the just claims of existing owners. . . .

"And now this doctrine (that society as a whole has an absolute right over the "possessions of each member) is being openly proclaimed. Mr. George and his "friends, Mr. Hyndman and his friends, are putting their theory to its logical issue."

To that Mr. George replies as follows:

"In nothing I have ever written or spoken is there any justification for such a "characterisation. I am not even a land nationalisationist as the English and "German and American nationalisationists well know. . . . I have been a staunch "denier of the assumption of the right of society to the possessions of each member, "and a clearer and more resolute upholder of the rights of property than Mr. Spen-"cer has been."

Without waiting to inquire whether Mr. George includes within the "rights of property" the right to property in land, it is enough to say that here at least Mr. Spencer is at a disadvantage. He disarmed himself before going into battle by refusing to read Mr. George's writings, and scorning to examine them he accused them of communism, confiscation, and land-nationalisation. Mr. Spencer cannot now strike back for he has thrown his weapons away. He is a prisoner in the hands

of Mr. George, who couples him with Parson Wilbur denouncing a print called the *Liberator*, "whose heresies," he said, "I take every opportunity of combating, and of which, I thank God, I have never read a single line." The parallel is well drawn; and the lesson of it is this, never challenge a man and then treat him with contempt; if you think he is not a foeman worthy of your steel, let him alone.

Had Mr. Spencer studied the works of Mr. Henry George, he would have found in them some doctrines having a manifest family likeness to communism, confiscation, and land-nationalisation; but they avail Mr. Spencer nothing, because he would not condescend to read the chapters where those revolutionary principles are. If he would bend his brow a moment and examine them he might find that in this controversy there are two perplexed philosophers instead of one. In the book before us Mr. George remarks:

"It is this confusion of Mr. Spencer as to rent and value that has led him into "confusion as to the right of property; and that, at first, at least prevented him "from seeing that to secure the equal rights of men to land, *it is not necessary that "society should take formal possession of land, and let it out*, and consequently, that "the difficulties he anticipated in taking possession of improved land were imag-"inary."

But, in "Progress and Poverty," Chapter II, he said:

"We should satisfy the law of justice, we should meet all economic require-"ments, by at one stroke abolishing all private titles, declaring all land public "property, and *letting it out to the highest bidders in lots to suit*, under such condi-"tions as would safely guard the right to improvements."

The italics are ours, directing the attention to apparent contradictions which it is for Mr. George to reconcile. And, if English words have any meaning, "abolishing all private titles" means confiscation; and "declaring all land public property and letting it out to the highest bidders," is land-nationalisation; at least, the ordinary reader may innocently think so, yet Mr. George declares that he is not a land-nationalisationist.

As a personal defense and explanation Mr. George has a right to say that he is not a land-nationalisationist, or a communist, or an "ist" of any other kind, and we are bound to take his word for it, but in this dispute that matter is wholly immaterial. The question before the meeting is this, Is Mr. George's book a land-nationalisationist or is it not? Is it a confiscationist or not? In "Progress and Poverty" Mr. George explains his meaning thus:

"I do not propose either to purchase or to confiscate property in land. The "first would be unjust, the second needless. Let the individuals who now hold it "still retain, if they want to, possession of what they are pleased to call *their* land. "Let them continue to call it *their* land. Let them buy and sell and bequeath and "devise it. We may safely leave them the shell if we take the kernel. *It is not "necessary to confiscate land; it is only necessary to confiscate rent.*"

The italics are by Mr. George; and a little farther on, he says;

"That is the first step upon which the practical struggle must be made. When "the hare is once caught and killed, cooking him will follow as a matter of course."

And several years afterwards, in "Protection or Free Trade," page 302, Mr. George describes the artful mechanism of the snare by which the hare is to be caught and killed:

"Now it is evident that, in order to take for the use of the government the "whole income arising from land just as effectively as it could be taken by formally "appropriating and letting out the land, it is only necessary to abolish, one after "another, all taxes now levied, and to increase the tax on land values till it reaches "as near as may be the full annual value of the land."

In that paragraph "government" is merely another word for "nation," and the taking away from private owners all the lands of the country "for the use of the government" is land-nationalisation, whether the taking be done boldly by imperial decree, or furtively by taxing it up to its "full value" and out of the hands of its owners.

The discrimination above made must apply to Herbert Spencer as well as to Henry George. Mr. Spencer has a right to qualify and explain as much as he pleases; he may properly say what he thinks now about the right of land-ownership, but the question at issue is this, What are the opinions of "Social Statics" upon the land question? Are they not in principle, and very nearly in expression the opinions of "Progress and Poverty"?

It is not to be denied that "Progress and Poverty" found moral support in "Social Statics." In fact, the disciples of Henry George, whenever their doctrines were assailed, brought Herbert Spencer into the field as a reinforcement. This, at last, gave Mr. Spencer great annoyance, and in a moment of irritation he determined even by a qualified recantation to withdraw the reserve brigade on which "Progress and Poverty" had so long depended for assistance. Hence, his letters to the *Times* and the *St. James's Gazette*, and the modification of his views which appears in "Justice." He tried to do this by dropping Mr. George to the ground, while endeavoring to stand on consistent feet himself; and this it is that inspires the vehement criticism of Mr. George.

With a scalpel most logically keen Mr. George has dissected Mr. Spencer's philosophy of land, and with almost Indian exultation he exposes its eccentricities and contradictions. As was inevitable, for we cannot get along without it, the old familiar Galileo moral is brought in by Mr. George to prove that "still it moves." He is right; for if it is ethically and politically true, as declared by Mr. Spencer in 1850, "that equity does not permit property in land," it will be true forever, and no extremity of recantation can make it false. The attempt of Mr. Spencer to show by duplicate metaphysics that his later opinions concerning land are not inconsistent with the occult meaning of "Social Statics," is a failure. It cannot stand a moment before the searching analysis and legible comparisons of Mr. George.

The attempt to resolve a concrete subject, such as government ownership of land, into abstract terms of justice limited or expanded by the right of some private person to the house on the land, and the barn, and the well, and the fences, and the apple-trees, and other appurtenances, corporeal and incorporeal, has involved Mr. George himself, as well as Mr. Spencer, in some confusion of thought, and has entangled both of them in varieties of statement not easy to reconcile. This might be due to obscure definitions and multiplied explanations, or to changes of opinion, but Mr. George asserts that Mr. Spencer's inconsistencies are the result of moral and intellectual dishonesty, prompting him to explain away his principles to propitiate the landlords and other aristocratic persons who admitted him into their high society after he became eminent, and before they knew that his philosophy denied the right of private property in land.

In his letter to the *Times*, apologising for "Social Statics," Mr. Spencer said:

"The work referred to—"Social Statics"—was intended to be a system of "Political Ethics—absolute political ethics, or that which ought to be, as distin-"guished from relative political ethics, or that which is at present the nearest prac-"tical approach to it."

And then the philosopher becomes a politician and frames for the landed and the landless a moral code, ambidextrous and elastic as a party platform. Duty, justice, right, and truth, lose all their absolute qualities, and become relative to expediency and our own convenience. He teaches us to oppose wrongs until they become vested rights and then defend them. He makes ethics changeable as our coats, and the man who can afford two suits of clothes may have two suits of ethics, an "absolute" suit for Sundays and a "relative" suit for every day; an "abstract" suit for wearing about the house, and a "practical" suit for business purposes. He may wear a suit of "pure" ethics when buying, and a suit of "applied" ethics when selling; and so, at last, by those harlequin morals, it happens that what we ought to do has no relation at all to "that which ought to be." Those pure subtleties and applied subterfuges make Mr. Spencer an easy mark for the indignant sarcasm of Mr. George, who shows what Mr. Spencer thought of absolute and relative ethics when he said in "Social Statics":

"When a man admits that an act is 'theoretically just,' he admits it to be "that which, in strict duty, should be done. By 'true to principle' he means in "harmony with the conduct decreed for us. The course which he calls 'abstractedly "right,' he believes to be the appointed way to human happiness. There is no "escape. The expressions mean this or they mean nothing."

The book is written in an angry vein, and the nicknames "traitor," "juggler," "apostate," and the like, add nothing to the value of its argument; they only give bitterness to the censure. They are not to be commended, although they ought to be excused, for they sprang out of "a tempest of provocation." Mr. George has been fighting under the banner of Herbert Spencer, and he feels like a soldier whose general deserts him in the battle and then disowns him altogether.

The only rational explanation of Mr. Spencer's letters to the *Times* and the *St. James's Gazette* is that he has radically changed his opinions about the private ownership of land; and his timid, uncertain, and equivocal way of saying so makes him look very much like the "perplexed philosopher" that Mr. George describes. At the same time it must be noticed that Mr. George himself is not so radical in this last book as he was in "Progress and Poverty." His principles appear to be the same, but in the application of remedies he is milder than he was about fourteen years ago. When he reaches Mr. Spencer's age he may be just as conservative and "perplexed" as that philosopher is now. M. M. TRUMBULL.

PERIODICALS.

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REVUE DE MÉTAPHYSIQUE ET DE MORALE.

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(Paris: Librairie Hachette et Cie.)

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PHILOSOPHISCHES JAHRBUCH.

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(Fulda, 1893.)

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*Questions of Philosophy and Psychology.

Ein Beitrag zum Nachweis des Esoterismus im Volksbewusstsein. By *Gottschalk Thorsten.*—GEHEIMNISS. By *Adolf K. W. Hochenegg.*—EINE GEISTERSTIMME. By *Hugo Gozdawa.*—DER BEGRIFF DES ABSOLUTEN. By *O. Plümacher.*

We cannot be accused of having any penchant for Theosophy or Spiritualism and find little occasion to praise their productions, which are usually crude and illiterate. But we must confess that Hübbe-Schleiden's review, the *Sphinx*, is greatly superior to anything in this field we have ever seen. There is artistic taste about it; there is, so far as its position admits of, a certain contact with positive science; there is an attractive popularity without shallowness. All these means are skilfully employed by the editor to impress his ideas, erroneous though they may be, upon his public. If the magazine appeared in English, instead of German, it would at once become the recognised leader in its field.

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